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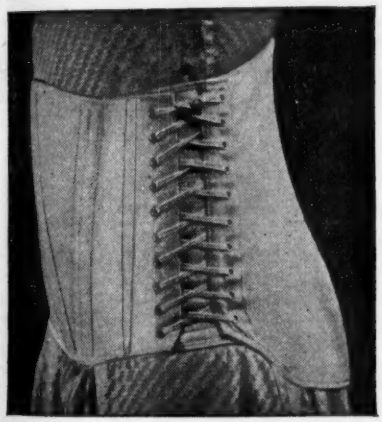

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The Massachusetts Medical Society

The next Annual Meeting of the Massachusetts Medical Society will be held in Boston, at the Hotel Statler, June 3, 4, and 5, 1935.

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Journal of Medicine

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The Massachusetts Medical Society

SECTION OF MEDICINE

Chamber of Commerce Hall, Worcester, Mass.

Tuesday, June 5, 1934, 2:30 p. m.

PRESIDING:
Dr. George R. Minot, Boston, Chairman.
Dr. Herrman L. Blumgart, Boston, Secretary.

CHAIRMAN MINOT: This afternoon we have four papers that deal with important problems of the practice of medicine in which each one of us will be interested, whether he chooses to practice as a specialist or as a general practitioner. Before proceeding to the program, I wish to appoint a committee to nominate officers for the Section of Medicine for the ensuing year. I nominate Dr. Reynolds of Boston, Chairman; Dr. Lunt of Concord, and Dr. Paddock of Pittsfield. Will those three gentlemen please meet and make nominations for a Chairman and Secretary for the ensuing year.

The first paper on the program is "The Social Conditioning of the Visceral Activities," by Dr. Abraham Myerson, Boston, Professor of Neurology, Tufts College Medical School.

DR. ABRAHAM MYERSON: *Mr. Chairman*—It seems to me that I am in a court room. Somebody asked me outside what the title of this paper meant, "Social Conditioning of the Visceral Activities." I told him if he listened to the paper and didn't know what it meant, then either he or I lacked intelligence.

THE SOCIAL CONDITIONING OF THE VISCERAL ACTIVITIES*

BY ABRAHAM MYERSON, M.D.†

THE sociology of man's life is as fundamentally biological as is his physiology. The fact is that the social structure becomes organized into a teaching mechanism of highly elaborate codes and traditional ways of life. This teaching mechanism tends to take command of the physiology, and the visceral life follows the general trend of learning, as stimulation, modification, and inhibition of the organic function of the individual become a great concern of society.

Just as the gases of the environment and the food-stuffs flow in and out of the individual, penetrating into his inmost recesses, becoming a part of him, then passing out in great streams of waste products, so the traditions, habits, emotions, and ideas of the community, of the living and dead, pass in and out of him, becoming part of his organized physiological and mental structure, and giving direction, coördination, and frustration to his visceral trends. Not only psychopathology, but actual visceral pathology is linked up in direct, as well as obscure, ways with the social environment of the individual.

The first teaching the individual receives, so far as his viscera are concerned, is administered by the mechanism of the conditioned reflex, as when the child is fed regularly, and the visceral preparation for food develops around the ideas and the economic circumstances of the parents; as when the child is taught to evacuate his bowels, empty his bladder in accordance with the aesthetic notions of the community through a process in which his intelligence is not at all involved. Almost from the beginning praise, blame, reward, and punishment, which remain the prime conditioning factors throughout life, enter upon the scene. The visceral habits later become consolidated into the personality by ideas and ideals of health, decency, and aesthetic evaluation. The hiding of the organs of evacuation, and consequently of generation, becomes so deeply entrenched in the personality life of the individual that for many people the fear of the violation, voluntarily or involuntarily, of this purely arbitrary code governs the activity of the bladder and bowel to the extent of pathology, as when constipation results, because of the social difficulties of reaching a place and time proper for evacuation.

I cannot take up in any detail the conditioning of all the viscera. This teaching-learning process brings even the organs of involuntary

*Read before the Section of Medicine of the Massachusetts Medical Society, at its Annual Meeting, Worcester, June 5, 1934.

†Myerson, Abraham—Professor of Neurology, Tufts College Medical School. For record and address of author see "This Week's Issue," page 234.

relationship under the influence of the social pressure. I shall confine myself to certain phases of the control, modification, and pathology of the gastrointestinal and genitourinary tracts, and to a consideration of those influences which modify sleep and the recuperative functions so that abnormal fatigue is brought about.

The gastrointestinal and genitourinary functions are peculiar, in that they are the prime sources of pleasure for the individual and are linked up anatomically in that they have common anatomical organs and so have shared the same fate in becoming the centers of those peculiar by-products of religion and morality, body-hatred, obscenity, and unworth. A great many of the dietary habits of mankind are linked up not with physiology or hygiene but with ideas of morality and religion. Only the more modern religions have become free from gastrointestinal implications and injunctions. I need not go into detail as to how importantly the genitourinary funetion, and especially the genital part of it, has become almost entirely a matter of the stability of society and the response to the teaching of widely divergent but always prohibitory codes, and not of the health or welfare of the individual himself. Since these codes of the gastrointestinal and genitourinary control are commonly not in line with the individual impulses and native trends, conflict arises which becomes important for the physician to understand.

THE GASTROINTESTINAL TRACT

Aside from the moral aspects of eating, drinking, and defecating, the social psychological structure has important bearing on the matter of appetite, digestion, nutrition, and the like. It can be set down as a law, that wherever there is a complicated society, eating habits become organized around the economic habits. Thus, the eating of three meals a day becomes definitely a matter of the work habits. It is difficult for an individual who is enmeshed in the economic activities to time his eating according to desire, rather than necessity. Thus, the secretion of his juices relates to the hours of his work and his economic necessities. The difference between the leisurely noon-hour meal and relaxation of continental Europe and the quick lunch and general anhedonic ingestion activities of American urban life needs only to be pointed out to illustrate this influence of society.

There is an inherent and constantly present tendency in human life to ceremonialize and refine the crude activities of the viscera. Thus, the manner of eating becomes for many individuals almost as important as the food-stuffs themselves, and this has a distinct bearing on the life of the child, since refinement may easily be hypertrophied into over-refinement. Furthermore, the process may start too early, so that in the effort to inculcate manners into the ways of eating, eating itself becomes interfered with, as I am convinced occurs for many a sensitive and "well brought up" child. The struggle to teach the child how he should cut his meat, how to butter his bread, and to avoid the hearty grab for food which is his natural trend may and, I think, does destroy appetite and thus brings about that finickiness at the table, which is the despair of many a mother, but which she has herself engendered. At many a table the child is badgered into a neurosis which is merely overinhibited and perverted visceral function. To put the matter more directly, were young children permitted to feed themselves and to eat in any way which suited them, without regard for manners and cleanliness, there would be fewer feeding problems of the growing child. Manners can profitably wait for that greater maturity in which they are naturally learned.

Moreover, there is too evident a tendency to regard each new bit of dietetic knowledge as the last word in science, and a host of people spring up who overemphasize the value of particular types of diet. This engenders what I call "social hypochondriasis", so that mothers, for example, feel that the fate of their children rests on whether they eat this or that article of food and force upon them unpalatable and undesired vitamins and calories, engendering still another struggle, which again interferes with appetite. In the case of adults this is clearly seen in the teaching of the relation of diet to blood pressure. There is no well-established relationship, but doctors do not hesitate to prescribe rules as rigidly as the laws of the Medes and the Persians for the hypertensive sufferer. The unhappy victim of high blood pressure thus becomes a neurotic in the matter of his diet and wonders with each ingested bit of food whether his blood pressure is rising or falling, so that he is more injured by his fear and anxiety than he would be by a possibly adverse diet. Where there is definite knowledge of the relationship between diet and disease, it is proper to be dogmatic. Where there is no known relationship, any such insistence injures the appetite, interferes with digestion, and takes away one of the prime pleasures of existence.

The fact that the digestive function becomes impaired by any intense fear or anxiety, that many people express their emotion by disturbances of the gastro-intestinal tract is not sufficiently taken into account by physicians. Thus, the beginning of many a neurosis is expressed by a disorder of the digestive tract. Such cases are not helped by making the patients eat that which they do not like for the sake of any fancied good to be obtained. The opposite prescription is nearer correct, that is, to "eat what you like," since the appetite fails regularly in

the neuroses and needs stimulation rather than repression. The gastric neurosis may indicate a social struggle, some relationship which is unpalatable and difficult to meet, or some frustration which has fundamentally nothing to do with the character of the food ingested.

SEXUAL FUNCTION

By a peculiar twist of the human mind, the function which perpetuates the race and is a source of the deepest and most ecstatic visceral reaction of the human being has been most fiercely attacked by the human mind and the social structure. Most of the sin ideas of western civilization concern the sexual activities.

The sexual function has been thrust into an underworld of desire, which creates socially whole underworlds of supply. The great social liberties which are taken with the sexual function are possible only because the sexual act is not necessary for individual survival, nor does chastity, so far as can be seen, interfere with longevity. However tormented the chaste individual may be, he lives as long and resists infection as well as his incontinent brother or sister.

The social structure shows the most curious ambivalence to the sexual life. On the one hand, there has been built up in human life the most continuous sensuality found in the living world, and from the standpoint of his tremendous sexual activities, man might well be called Homo Sensualis rather than Homo Sapiens. On the other hand, many individuals in a civilized society may reach a relatively great maturity before they are permitted participation in the sexual life, and others live and die without even entering into the sexual relationship.

There are, thus, to be found two sorts of influences playing upon the sexual organs; one, which we may call *aphrodisiac* in that they tend to heighten the sexual desire and potency, whereas side by side with them and operating against them are *anaphrodisiac* forces of great power. Thus, the concealment and revealment of clothing, the incitation of perfumes, the crowding together in places of transportation and entertainment, the movies, the theatres, a good deal of the literature of the world, the whole mystery and concealment of sex itself, all these are social aphrodisiacs. The ascetic views of life, the preaching of most of the religions, the prohibition of the law, the continued teaching in homes, schools, and elsewhere, the hatred of pleasure and the denunciation of sin, which is so prevalent a social attitude, these are anaphrodisiac forces. Both sets of forces operate within the same individual, throwing his visceral responses into a sort of confusion, as well as creating within him the most dramatic and the most dramatized personality conflicts. The artist, the writer, and the humorist would lose most of their material if a purely physiological attitude toward sex were to prevail.

It has been pointed out by Freud that the sexual activities may be divided into two groups, the forepleasures and the sexual act itself. The forepleasures include courting, embracing, kissing, and like activities, all of which increase the sexual tension. The sexual act discharges the sexual tension and the emotions attendant on it. In the social structure, as it is at present constituted, the forepleasures are not greatly frowned upon, and since the final sexual relationship is mainly forbidden, the forepleasures become ends in themselves, instead of means to an end. In other words, the young are subjected to a great deal of sexual stimulation without biological and psychological relief. Even in adult life there is a continuous overstimulation of sexual feeling and desire which constitutes not only visceral tension but psychological struggle as well.

With the introduction of birth control measures, which spread for social reasons, the problem of a satisfactory sexual life in the marriage relationship has become greatly complicated. For the majority of people the various forms of birth control do not give full satisfaction, or else they operate to delay the sexual response beyond its physiological limit. While we need not subscribe to the extreme position of some neurologists and psychiatrists that the anxiety neuroses are due to increased sexual tension without relief, or to coitus interruptus, sexual dissatisfaction and unsatisfaction show themselves in neurotic symptoms, involving practically every visceral function, as well as creating triangles, compensational culture seeking, and a high divorce rate.

The necessary delay in the marriage relationship, together with a fear of disease and moral scruples, undoubtedly operates to increase the amount of masturbation. The ancient medical attitude toward masturbation, and the belief that most of the mental ills including insanity are results, have not yet passed away from the community, and bring intense fear states. Nor is the modern belief that masturbation does no harm entirely justified. It is my belief that masturbation in excess does actual damage to the sexual function and probably to the vasomotor mechanism of the body. There is, however, no question that there is damage to the personality and to the feeling of energy and enthusiasm which so largely depend upon the sentiment of self-respect. Here the social structure is a very important factor in bringing about the abnormal use of an organ, and the development of habits quite injurious to the individual.

SLEEP AND FATIGUE

It is not necessary in this paper to delve into the physiology of sleep or of fatigue, nor would

it be profitable since these everyday matters are as yet in the early stages of research. Very important work has been done in recent years to show the relationship of sleep to the nervous structures in and about the hypothalamus. Its great place in the recuperative anabolic activities of the organism needs no amplification. Sleep is one of the great appetites of life. As in all appetites, there is desire in the drowsy feeling, and the satisfaction which is experienced after sleep is comparable to the sense of well-being after the ingestion of food. Almost constantly in the neuroses there is disturbance of sleep, and I am convinced that he who will solve the problem of restoring sleep will help mankind enormously in the prevention and cure of the neuroses.

Man is a diurnal animal, whose main activities are carried out in the daytime, and it is probable that he should seek relief from excitement and stimulation at night in the necessary preparation for sleep. Unfortunately, in any highly evolved economic civilization, the main escape the human being has from the monotony and irksomeness of his life is in the night. That is to say, the social structure produces its technique for entertainment and excitement at a time when the organism should be preparing for rest. Those who invented lighting devices, especially the electric light, simply made it possible to transform night into day. This has enormously increased the stimulus-seeking of the human being. It is very questionable whether it is good for man to extend his day well into the night.

A typical twenty-four hours for the average human being, let us say, in a great American city is to work during the daytime at occupations which furnish the necessary bread and butter and other accessories, to go home rather tired at night, to wash, to dress, to dine, to shake off his fatigue by coffee, alcohol, company, and then to go for entertainment and excitement to a theatre, dance, party; in the case of the culture seekers, to a lecture; for the young, in courting, petting, and the various modifications of the sexual life. All this puts off sleep, calls upon reserves of strength and energy beyond the powers of recuperation of many individuals. Sleep becomes imperfect, because there has been no preparation for it, since in most cases the plunge is made from the height of stimulation into sleep. More often sleep is shortened, in that while the working hours are fixed, the entertainment hours are not. The individual has to choose between getting the proper amount of rest and the enjoyment of the society of his kind. The choice is a hard one especially for the young: either way they suffer. In the one case, the visceral functions are disturbed by the social life; in the other, the social activities, which are so essential to the sense of belonging, are disturbed by the necessities of the visceral life.

One could dilate endlessly on the influence upon sleep and energy of the great economic ups and downs. The great inventions, such as the automobile, the radio, and the telephone, become instruments which bombard us with stimuli which we seek and which we cannot escape. Machines are developed which save mankind the straining back and fatigued sinews; labor-saving devices they are called. And yet, there is probably no more common complaint than the soul enervated one, "I'm so tired", depicting a fatigue which is felt the less one labors with the body and the more one partakes of the stimulations and excitements of the machine age.

The fascination of medicine rests in the fact that it is a social as well as a biological science. In the last analysis, disease is not merely a matter of injured tissues, although these have their social origins and implications. Disorders of visceral functions and trends have their roots in the world of taboo, custom, conflicting ideas and ideals in which we all live, and in which only the strongest and most fortunate remain well, in that they maintain visceral integrity in a world of difficult social adaptation.

DISCUSSION

CHAIRMAN MINOT: Undoubtedly the rôle played by social factors in the etiology, diagnosis, treatment and prevention of disease is becoming more widely recognized. Medical social conditions have been recognized for centuries but it is largely since 1915 that fundamental information pertaining to these problems has been obtained and increasingly appreciated. We are fortunate in having another student of the subject with us today, Dr. Lawrence K. Lunt of Concord, who will open the discussion.

DR. LAWRENCE K. LUNT: *Mr. Chairman and Gentlemen*—I had the pleasure of seeing this paper before its presentation. The nature of this hall, I am afraid, may have made it difficult for some of you to hear, but, if you didn't hear, I can assure you that it will be well worth your while to read it when it is published. Dr. Myerson speaks always with authority, and as always he presented his subject in his usual interesting and stimulating way. There are a number of points in the paper that he might easily have enlarged upon; there are others that stimulated thought and speculation. I am sure that when you read this paper you will find that this is true. He mentioned the genesis of many gastric neuroses in childhood; that, I am sure, is a subject that has not received enough general notice. It is well recognized, by those who deal with the mental side of child life, that early experiences in the family, at the table, can most decidedly bring about initial responses which in later life interfere very seriously with social adaptations.

I remember very distinctly one man, the only one I happen to have seen, who acquired the habit of rumination. It appeared that his mother had done exactly the same thing, and he thought that it was perfectly natural for him so to do. He was quite astonished when he was told in no uncertain terms that it was not necessary, and from that point on he no longer practiced that delightful habit. It was rather difficult for him, because obviously he

was not a very pleasant social companion, as it interfered distinctly with his social adaptations. Now, there was a visceral response conditioned in childhood that had a very distinct social significance.

Dr. Myerson has pointed out the ambivalent attitude toward matters sexual. That, as you know, is the presence of diametrically opposed attitudes in regard to any subject, and he very clearly showed how we are stimulated sexually in many different ways, and at the same time repressed. That condition exists in every human being, at some time in his life, if not all through his life. That ambivalence, however, is not only in the sexual field, but also in many other fields as well. It is evidence not only of social pressure on the individual from the outside, but I believe also it is evidence of pressure within the individual producing conflict.

We all have within us the instinctive drives to which are attached inseparably our visceral responses. On the other hand, is the factor which we can call spiritual, or, if you will, the ethical or moral factor, which is in pretty constant conflict with these visceral and instinctive drives, modifying them and often completely suppressing them.

We may feel that that inhibiting pressure on our instinctive appetites and desires is a thing which comes to us from outside, but as a matter of fact it probably starts inside each one of us.

Medical psychology, by disregarding this point, has overemphasized the importance of these instinctive drives, and has left out entirely too much this factor of the ethical or spiritual nature of man. I think Dr. Myerson would agree that we need not confine the classification of man to homo sexualis, but can say that he deserves in many instances the old classification of homo sapiens and perhaps also homo spiritualis.

In regard to the many things that tend to interfere with rest and relaxation, Dr. Myerson raised the question whether man was intended to be exposed to these disturbing factors. Certainly many of us feel at times that we were not intended, and wish that we did not have to be exposed to these noisome pestilences. However, man is an extremely restless creature, and these evidences of progress, progress of his knowledge, the results of his curiosity, are going to make him continue to stimulate and torment himself with these signs of so-called progress.

I believe that the human being is going to be able to meet these advances in the difficulties of adjustment which he creates himself, because it seems as if there were no doubt that the human being has not yet reached the limit of his capacity. Dr. Frederick Tilney, I think, at one time arbitrarily estimated that our sensory functions in the main were only thirty per cent developed, using Helen Keller and her tremendous ability with the tactile sense and our own incapacity in comparison with her.

Man is going to continue to develop, and probably there is some element of truth that only the fittest are going to survive in the long run. In closing, as well as in opening, Dr. Myerson called attention to the fact that the fascination of medicine lies largely in the fact that it is a social as well as a biological science. I think possibly the average doctor is a little too modest to consider himself a sociologist, but whether he considers himself as such or not, it is an inescapable fact that he has to be exposed to sociological influences, and he is a sociological influence himself. The more he realizes that, the more he is going to understand his patient as a human being and not simply as a sick intestine, or a sick heart, or whatever it may be.

The more the doctor realizes that the patient has a mind which is reacting to all of these social factors outside himself, and these personal conflicts within, the better doctors we will have.

CHAIRMAN MINOT: Dr. Myerson's paper is now open for general discussion. If there is no discussion, we will proceed to the second paper.

Cancer is undoubtedly a condition with which all doctors must be well acquainted. There is a tendency to think of it as a subject to be presented by a surgeon, but to-day we are to have the pleasure of hearing about cancer from Dr. Henry Jackson, Jr., Boston, Assistant Professor of Medicine, Harvard Medical School. Dr. Jackson.

CANCER AND THE GENERAL PRACTITIONER*

BY HENRY JACKSON, JR., M.D.†

Mr. Chairman, Ladies and Gentlemen:

IN the short time at my disposal I should like to allude briefly to certain points in regard to the diagnosis and treatment of malignant disease which I believe should be familiar to all of us.

In the last analysis, whatever may be the advances made by the laboratory worker or the cancer specialist, the main hope, for the present at least, of reducing cancer mortality and morbidity lies in the hands of those of us who have the opportunity to see this disease in its early stages and those of us to whom the patient comes at the first signs of illness. On us and on the laity rests the responsibility of the early diagnosis and the prompt treatment by adequate measures of this, our most dreaded malady. And it is also a part of our duty to educate properly our patients and their families, not only as to the necessity for early diagnosis but also as to the undoubted curability of many forms of cancer taken in their incipiency.

Let us consider in the first place the cause of cancer. We, as physicians, are constantly asserting that we know little or nothing of the cause of cancer and our opinions are too often echoed in the expressions of the educated public. And yet at the same time we often express the hope that some day some scientific wizard will discover the real cause of cancer and thus place this disease on a par with certain of the infectious conditions, as for instance tuberculosis or typhoid fever. Such often are our feelings. Yet in these opinions, as Ewing points out, lies a great fallacy which we may as well face now. We know the cause of tuber-

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†Jackson, Henry, Jr.—Associate, Thorndike Memorial Laboratory. For record and address of author see "This Week's Issue," page 234.

culosis. It is the tubercle bacillus. Yet we must acknowledge, if we be honest, that we have little or no knowledge as to how the tubercle bacillus brings about the peculiar pathological changes which we recognize clinically as phthisis. The organism is present and the results well known. By what ultimate mechanism are these results brought about? This remains a mystery. We are aware of the constant presence of living organisms; exactly how they produce the tubercle and the consequent ulcerations and cavity we do not know.

Yet on the other hand, we know beyond peradventure of a doubt that cancer of the buccal cavity is caused by ragged and poorly cared for teeth, excessive smoking and syphilis, often in combination one with another. How these factors produce the changes is unknown, but no more so than the mechanism by which the tubercle bacillus effects the familiar picture of consumption. That chronic irritants of this nature may often result eventually in the disordered and unrestrained cell growth of cancer is clear—how they do so is not. In the last analysis we know as much, or as little if you choose, of the cause of certain forms of cancer as we do of the cause of tuberculosis or typhoid fever.

I have said that often the hope is expressed that we know as much of the etiology of malignant disease as we do of infectious disease. We hope by this knowledge to be able to combat the condition in a more effective manner. Yet when we are confronted with a case of established tuberculosis we are wont to place our greatest reliance on rest, good food and fresh air. The reparative processes of nature are thus given a better chance to cure the patient. We do not strike at the ultimate cause, for we do not know it. We have no specific remedy even with our knowledge of the specific etiological agent. Yet in the cancerous patient we often, I am afraid, ignore our rather extensive knowledge of the contributory causes and somewhat fruitlessly spend our energy in searching for some fundamental tissue disturbance, the control of which might bring to a stop the abnormal and destructive growth of malignant cells. There would seem to be but little basis for the hope that such control of growth can in the near future be obtained; for the nature of abnormal cell growth is far more complex and far less understood than is the nature of the inflammatory reaction to infectious disease. We can, by avoiding the cause, prevent the disease from becoming established. We can, by our own efforts, do little to alter these destructive reactions to infections once they are established. We but aid nature in the cure of established infection. Thus it is in the case of an infection. By the same token in cancer we should pay more attention than we do to the elimination and prevention of these initiating factors classed under the head of chronic irritants which are well known to precede and indeed to cause clinical malignant disease.

Intra-oral cancer is, as I have said, well recognized by competent authorities as being caused by poor teeth, ill-fitting dental plates, excessive smoking and syphilis. Cancer of the larynx and esophagus can often be traced back to preceding chronic infections, to excessive smoking and to the ingestion of abnormal amounts of hot or irritating foods. Malignant disease of the stomach and rectum refuses to reveal, as Ewing states, its effective causative factors. But we must constantly bear in mind that cancer of the cervix is a disease of women who have borne children and that it may be traced in many instances directly back to unrepaired cervical lacerations or to unattended and untreated uterine infections. Our duty to our patient is clear. These lacerations must be prevented or repaired if we are to combat effectively cancer of this region. So also we must constantly remember that malignant disease of the breast is often to be found in functional or endocrine disturbances and that in many cases the irritation of stagnant secretions precedes the development of a malignant tumor. Proper hygiene of the nursing breast would do much to reduce the incidence of malignancy in this organ. Skin cancers are well known to be preceded by various forms of chronic irritation, be they mechanical or chemical. The improper and prolonged use of arsenic may be an important factor. The proper appreciation of these facts coupled with a knowledge of the clinical aspects of the early stages of carcinoma of the skin would greatly assist in the elimination of this disease.

Now as to heredity. The question is constantly being brought up by the laity and we should have at hand the necessary knowledge to combat the many erroneous ideas that are proposed. That certain types of cancer are definitely hereditary in animals has been unequivocally shown by Slye and others. But the transferral of their results to the cancer problem in man is fraught with considerable danger. We are not mice. A few cancers, such as glioma of the retina, multiple enchondromata and certain forms of melanoma appear rather definitely to have a hereditary basis in man. Here the list of definitely hereditary malignant diseases ceases. There is, to be sure, some evidence that certain individuals inherit a bodily pattern which makes them more susceptible to malignant disease of certain organs, but there is little evidence that cancer as a general disease may be inherited. The most cogent evidence along these lines is that collected by Little, who showed from a study of case histories in the Eugenics Record Office of Washington that cancer did actually occur considerably more often

among the descendants of cancerous parents than could be accounted for by chance alone. This point is of importance. Those of us who have much cancer in our forebears should guard as best we can against the known causative factors of this disease. No more can truthfully be said.

Our best hope for the eradication of this disease has always lain in its early recognition and we must all realize the possibility of the presence of malignant disease even though few if any outstanding symptoms be present. It is a mistake to believe that a cancerous patient must show signs of general ill health; for not infrequently even advanced malignant disease may be present without any impairment of the patient's general health whatsoever. Nor, on the other hand, has every cachectic patient cancer. Any lump, however innocent looking, any rectal or vaginal bleeding, any change in bowel habits, any unexplained loss of weight or appetite should immediately arouse our suspicion of cancer.

Particularly must we be on our guard in the case of the various types of lymphoma. The presence of enlarged lymph nodes in the neck or elsewhere is all too often laid at the door of acute or chronic sepsis and the indisputable fact that enlarged lymph nodes associated with the most deadly forms of lymphoma may and frequently do recede and even disappear temporarily with the subsidence of a coincident infection, lulls both the patient and the doctor into a false sense of security. Yet it is in this stage that these diseases offer our only chance of cure. The clean excision of an isolated lymph node never in my experience has caused trouble and thus only can the proper diagnosis be made and rational therapeusis initiated.

Again we must bear in mind in regard to the lymphomas that any or all organs may be early involved and that symptoms referable to the nervous or osseous system, unexplained fever or fatigue, or curious skin lesions may be the only complaint of patients suffering in reality from local or widespread lymphoma.

On the other hand the diagnosis of inoperable cancer is too often made upon inadequate grounds and the patient allowed to go downhill without specific treatment or proper investigation because of the supposed hopelessness of the situation. The symptoms and signs of cancer are protean and legion and we have seen patients sent to the hospital with a diagnosis of inoperable cancer when in reality they were suffering from such diverse and amenable conditions as pernicious anemia, hemolytic jaundice, amebic abscess of the liver, Plummer-Vinson's syndrome, benign ulcers of the stomach and even advanced chronic alcoholism with polyneuritis.

We must, I think, avail ourselves of all the modern diagnostic measures, including biopsy when possible, before the stamp of inoperable cancer is put upon the patient.

All of us from time to time have the problem of the treatment of the advanced and inoperable cancer. It is a mistake to believe that nothing can be done for these patients. Adequate diets, suitable for the individual case and containing appropriate elements, will do much toward supporting the patient and rendering him more comfortable. In those cases which have a marked anemia the adequate administration of iron and more rarely of liver extract may produce remarkable changes in the whole picture, build up the patient's resistance and render him more comfortable. Scrupulous cleanliness in regard to open and ulcerating cancers and their frequent dressing (not once, but many times a day) can work marvels in the reduction of otherwise intractable pain.

The utilization of drugs for the relief of symptoms is always important. An aspect of but one—morphin—will be referred to. Many cancer patients come sooner or later to morphin; yet it is surprising how this hypnotic can be done away with in many instances. Of ninety consecutive patients discharged alive from the Pondville Hospital, the cancer hospital of the Commonwealth of Massachusetts, twenty were taking morphin either preoperatively or as treatment postoperatively in the hospital, but not one of the ninety was taking morphin on discharge. Small doses of codein and aspirin sufficed in every case to alleviate pain after proper care had been taken of the patient. One man when admitted had been taking three grains of morphin a day, and yet, though leaving the hospital with inoperable cancer, he was taking only one half grain of codein supplemented by aspirin. Chronic morphinism may make a patient even more uncomfortable than the disease itself.

In order to place patients in the best possible state of health, all aspects of the individual's ways of life and of his personal case are worthy of attention. Thoughtlessness and haste on the part of the physician can jeopardize the life of a patient. The amount that can be done for the sick man and the prevention of disease is great, but requires time and thought. Careful medical attention should be given the cancer patient for the "secret of the care of the patient lies in caring for the patient".

Finally, one word as to general cancer cures and cancer nostrums. They are as useless as they are perennial. Yet it is often difficult to persuade the lay public that this is so. That actual cures have followed the administration of such drugs as Glover's serum does not constitute valid evidence that these nostrums should be widely and hopefully used. It must be remembered that over 300 spontaneous cures of proved cancer have been collected by thoroughly reliable pathologists.

DISCUSSION

CHAIRMAN MINOT: Dr. Truesdale of Fall River will open the discussion.

DR. P. E. TRUESDALE: *Mr. Chairman, Members of the Section*—Dr. Jackson has left very little to be said on this important subject. His lecture very ably delivered, adds much to the equipment of the general practitioner, the surgeon, the radiologist, and others who participate in the treatment of cancer. We require a liberal knowledge in order to treat this disease intelligently. To make progress we should keep well informed. Besides being able craftsmen, we need more enlightenment. As physicians we are interested in all phases of investigation bearing upon the origin of cancer; we are alert to the increasing frequency of its occurrence, and we are tolerant of new ideas and new theories which are offered almost daily.

As practitioners we are concerned with the prevention and treatment of cancer. The precancerous lesions and the methods of dealing with them have been rehearsed so often before you that I shall not dwell upon them. We are entirely content with the theory of chronic irritation as an exciting cause of cancer, and that all evidences of such should be treated early and in a radical manner. Many of us believe that chronic irritation is the strongest single factor causing the first biological change in the rest cell.

When we observe cancer, the point of irritation is invariably eclipsed by the growth. When cancer is deep seated, the point of irritation is invisible, but often its preëxistence may be brought out in the history.

In cancer of the surface of the body we usually find evidence of a point of irritation. In the application of our purpose to prevent cancer, we must concern ourselves actively as practitioners in the removal of these tiny lesions, especially among the class of people who by heredity are predisposed to cancer. Warts and slight areas of pigmentation among older people are not important.

Let us depart for a moment to consider the factor of heredity. I think this has been very ably covered by Dr. Jackson. However, from my own personal experience and observations, I am inclined to attach more significance to heredity than he. I speak of this because I feel that the growing tendency to belittle its importance may ultimately do more harm than good. We attach considerable significance to heredity in tuberculosis, epilepsy, hemophilia, sclerosis of the lateral and posterior columns of the spinal cord, psoriasis, palsy, migraine, neuralgia, chorea and, in fact, most of the other diseases including the hereditary susceptibility to certain types of infections.

As a matter of fact we know that heredity assumes the same importance in relation to cancer as it does to these other diseases. In our zeal to allay the fears of the public, are we justified in concealing what in our practical experience, at least, appears to be evident? Are we justified in concealing the inevitable truth from the general public and practitioners who want a guide in their opinions on cancer? At least it would seem to me fair to supplement the statement that "cancer is not hereditary" with the expression "but the tendency to develop cancer occurs in certain families".

Now may I show a slide to add a little force to that point. On this slide is represented the lower extremities of a man who was hospitalized for two months on account of a fracture of both bones of the leg. He had a posterior wire splint, and for many weeks this splint caused an irritation on the outside of his foot. As the sore appeared, it was bandaged. According to his story it was merely treated as a little ulcer. Various ointments were used in an attempt to heal the ulcer, but it didn't heal.

He appeared at the clinic two months after he left the hospital. This individual has a family history of carcinoma. Here is an area on this individual's anatomy where cancer very rarely occurs. I have not seen a new growth in that particular location, nor have I found the report of a similar case.

(Next slide, please.) On further examination you can see what we discovered, (designating) a considerable degree of metastasis in his inguinal region. Nothing could be done. He died in six months. What happened in this case appeared to me to support evidence of a predisposition to cancer.

We are charged almost daily with the responsibility of treating cancer. Immediately we find ourselves faced with tremendous odds. First, our own inability to detect cancer in its incipient stage; secondly, our inability to get a patient with cancer to appear early even after recognizing the symptoms; yes, even after all the publicity which has been given to this phase of the subject. And this applies more to members of the medical profession who suffer from cancer than to laymen. Our own roentgenologist had a carcinoma of the descending colon, and was admitted to the hospital for acute intestinal obstruction, although without having made any complaint he had suffered about eight months from perfectly typical symptoms of this disease. Meanwhile he was frequently making the diagnosis of this disease on other people.

How often do you see anything more than an exploration on a doctor who has cancer? And how often do you see a member of a doctor's family in time to undertake curative measures for cancer? One may answer these questions with the words, "Very rarely, excepting when the neoplasms occur on the surface of the body."

Individuals with lumps, sores, cavity, bleeding or discharge, suspecting cancer are overtaken with a peculiar form of behavior. It is one of fear and reticence, and a tendency, if not an apparent willingness, to ignore the physical signs which have been posted far and wide. The patient's answer, to your amazement is, "no pain, no worry, just a lump, just a little blood, or just a slight discharge."

In the State of Michigan, Leucentia and Weller say there are to-day about 15,000 cases of cancer. Counting the cases in the states of Massachusetts, Michigan, and California, and then computing roughly for the rest of the area of the United States, there are probably between 300,000 and 400,000 cases of cancer in the United States. Now this represents the largest secret society in existence, unorganized to be sure, but reticent and almost unanimous in the expression "no pain, no worry".

Human nature is still the biggest hurdle in dealing with cancer. How to handle the patient with cancer is one great problem. How to be kind, how to be patient, how to be truthful, how to be helpful without being brutal is a problem the answer to which is not simple.

One of the patients who came to us after a year and a half of experience with quackery, was told at the beginning by an able doctor, whom she consulted for piles, that she was not a patient for him, that she had a growth in the rectum, and should see a surgeon. She went to a surgeon who told her point blank that she had a cancer and ought to get busy and be operated upon at once. She became frightened and wouldn't go near another regular doctor. She succumbed to the charlatan. That is human nature.

What we must cultivate continually is a spirit of hope and optimism, not blinded, but tempered and

balanced. We have to talk about our own cases of recovery. The patients will not do it for us. They are secretive even after recovery. Knowledge on the subject offered the public has not been harmful. As it has percolated through a medium of ignorance, prejudice, and quackery, the crop has appeared lean in proportion to the planting, but what progress we have been able to demonstrate either in prevention or treatment has been well received.

The management of the cancer problem should be kept well within the control of the medical profession. Medicine enjoys a public trust which it never has abused. The public mind has been brought into a receptive mood. It is ready to accept what we have to offer, but it must be genuine. It will be gospel when it is fully endorsed by the regular medical profession, and only then.

CHAIRMAN MINOT: This paper of Dr. Jackson's is open for general discussion. As there is no further discussion we will proceed to the next paper.

We are privileged to-day to have a distinguished authority speak to us on the next subject. Rheumatism means different conditions to different people. The term, I believe, was first used by Ballonius, a Paris graduate in 1570. Since then many men have studied "rheumatism", sometimes critically, but often casually. Dr. Swift has studied rheumatic fever thoroughly and carefully, for a considerable number of years. He will speak to us on the "Chronicity of Rheumatic Fever." Dr. Homer F. Swift, New York, Member of the Rockefeller Institute for Medical Research.

THE CHRONICITY OF RHEUMATIC FEVER*

BY HOMER F. SWIFT, M.D.†

IN considering the fundamental nature of a disease it is sometimes of value to orient our conceptions about points other than those appearing on first sight to be diagnostically significant. Time occupies such a place, for the period required for an illness to run its course is, indeed, one of the most frequent questions arising in the minds of both patient and physician. For the former the answer is important in order to permit him to arrange his economic life the most effectively; and for the latter a proper comprehension of temporal factors is necessary in the shaping of suitable therapeutics.

Unconsciously, our pictures of pathological states are influenced by the manner in which they have first been presented to us as well as by the most dramatic symptoms and signs occurring at the bedside, and for this reason the idea of acuteness is usually in the foreground of our conception of rheumatic fever. Acuteness and chronicity have different implications; sometimes the word acute is confused with the idea of severity, because many symptoms of short duration often have a concomitant quality of intensity. Strictly speaking, however, acute should describe rapidity of onset and relative brevity. Chronicity, on the other hand, implies continuation for long periods. It may have different connotations; for example, an etiologic agent may remain in the body for years without calling out symptoms of disease; in other words, there may be almost absolute chronic latency. A small well encapsulated focus of microörganisms, such as tubercle bacilli, may induce and keep active a chronic state of hypersensitiveness, which will only be made manifest when tuberculin or tubercle bacilli are deposited at some area in the body. Again, the pathogenic activity of the causative agents of disease may be always slightly greater than the resisting mechanisms of the body, and as a result there is a chronic state of active disease; or the tide may swing alternately between activity and latency with years elapsing before the outcome of the contest can be known. All of the above-mentioned types of chronicity merit consideration in a discussion of the nature of rheumatic fever.

Certain manifestations of a chronic disease may be acute; for instance, the roseola in syphilis, or the acute pneumonic phthisis in tuberculosis, and yet the essentially chronic nature of the primary affection remains. Indeed, by focusing our attention too closely on such acute symptoms we may lose sight entirely of the real nature of the underlying process. This is especially true in diseases where a certain proportion of cases are characterized chiefly by acute manifestations.

Let us now pass from these general considerations concerning certain phases of chronic disease to a more detailed discussion of some features of rheumatic fever. Histopathological studies emphasize the chronic nature of the underlying process. While this is not the place to review minutely the evolution of the rheumatic lesion, it may be worth while to recall that three stages are now recognized: an early one in which there is focal injury of the mesenchymal supporting structures, focal or diffuse fibrinoid swelling of the ground substance, or even necrosis of the tissues; this period is marked by edema and invasion of wandering cells, and may be designated as the exudative stage. It is followed by granuloma formation about the injured tissue, in other words, by proliferation. And finally, the granulomata are replaced by scars.

These granulomata are the most characteristic histological structures occurring in rheu-

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matic tissues; indeed, many authorities regard them as absolutely specific, just as much so as tubercles or syphilomata. If we accept the postulate that in general those diseases which are characterized by granulomata are also chronic in their evolution then this feature alone would throw rheumatic fever into the class of chronic afflictions. Unfortunately, granulomata in the viscera and blood vessels are not subject to direct observation during life. But we can observe subcutaneous rheumatic nodules clinically and record their duration. True, some persist only a few weeks; but as a rule months elapse before a nodule has completely run its course macroscopically. When we add to this period the two or three weeks that have usually passed between the time of the initial microscopic injury and the appearance of the nodule, and also the period of scar formation, there can be but little doubt of the essential chronic nature of these granulomata. Subcutaneous nodules, moreover, usually appear in repeated crops at irregular intervals over considerable periods of time, and their discovery is a sign that the patient having them will be an invalid for many months.

Most pathologists agree that subcutaneous nodules are of essentially the same nature as Aschoff bodies in the myocardium or of granulomata in the valvular and mural endocardium, blood vessels, joints, upper respiratory tract and elsewhere. It seems logical, therefore, to conclude that in these occult locations the chronological course of events is not essentially different from that which can be so accurately observed in the subcutaneous tissues. Indeed, one has only to recall the period that elapses between the first attack of rheumatic fever and the establishment of signs of mitral stenosis, or of well-marked valvular insufficiency, to realize the importance of the time element in the pathogenesis of rheumatic valvulitis. Sclerosis, the final stage of valvular disease, certainly is evidence of a chronic process.

Another point in pathogenesis is noteworthy, namely the tendency for the sites of healed lesions to become reinvolved; for instance, many valves show signs of multiple attacks from the rheumatic poison in different stages of evolution. Indeed, this tendency, extending over relatively long periods, is probably of great importance in the induction of cardiac crippling; for could recurring infection be stopped, it is probable that many hearts would have sufficient reserve to function satisfactorily. Numerous instances are recorded of patients, with deformed valves giving rise to intense cardiac murmurs, who have led perfectly satisfactory lives provided they have built up sufficient general immunity to resist renewed infection. Recurring chronic infection, then, is an important element in the production of progressive carditis.

Developmentally, the heart is simply a highly specialized portion of the cardiovascular tree; hence it is not surprising that those poisons which attack this organ should also be potent sources of injury to the blood vessels. We no longer regard the arteries and veins as mere lifeless channels for leading the blood to distant parts of the body, but realize that under suitable conditions the cells forming these tubes become active immunobiological structures. For example, when properly conditioned by antecedent injury or infection, the endothelium may become very markedly phagocytic. When the body is highly sensitized to a foreign protein, of either bacterial or non-bacterial origin, the tissues forming the vascular walls may show marked hyperergic inflammation provided the offending antigen is brought into intimate contact with them; and considering that the blood vessels are the avenues over which both beneficial and harmful substances are transported to all parts of the body, it is easy to understand how readily such contacts are made.

Considerations of this nature have more than academic interest, for it is now well established that rheumatic vasculitis occurs almost as frequently as carditis. The relatively active function of the heart, compared with the more passive rôle of the vessels, long served to attract attention to lesions involving the former to the neglect of those in the latter. The macroscopic verrucous endocarditis was long the center of interest, and only comparatively recently has a clear understanding of the microscopic injury to the underlying cardiac structures been attained. The recognition of mural endocarditis, aortitis, and coronary arteritis opened our eyes to the importance of examining the more distant blood vessels for evidence of injury from the rheumatic poison, and the search has been rewarded by indubitable proof of numerous characteristic lesions in them. All stages of the rheumatic inflammatory process have been described in both arteries and veins; the more carefully one looks the more frequently are they found. It is highly probable that the same immunobiological laws governing their localization and intensity are operative here as elsewhere in the body: points most subject to stress and strain and to physiological trauma, in general, seem to show the most marked tendency to be severely attacked by the rheumatic process; old rheumatic lesions are unusually liable to reinvolvement; scars and sclerosis are often the results of repeated attacks. In the light of this knowledge it is easy to understand the point of view of those who regard rheumatic fever as the most common causative factor in the production of chronic vascular disease; and while it may be unwise to endorse unreservedly such an extreme concept, it is important to recognize the rôle of rheumatism in the etiology of vasculitis, especially in the first three or four

decades of life, and also to realize that during this earlier period vascular injuries may be inflicted which are possibly the sites of so-called senile arteriosclerosis. Senile changes may be conditioned by chronic, low-grade and recurring infection as well as by the passing of years. If "a man is as old as his arteries", infection-induced vascular alteration may accelerate physiological time to a degree not differing greatly from that induced by senile desiccation of the tissues.

In the preparation of the soil for the course of events which we recognize as rheumatic fever, it is probable that much time is required. Possibly some of that time has been passed in the bodies of the ancestors of a rheumatic subject in developing the condition known as the rheumatic diathesis or constitution. I realize that in discussing "rheumatic constitution" I am treading on controversial ground, and that even, at best, it is only one of a number of factors in the induction of the disease. Nevertheless, the high familial incidence of rheumatic fever should lead one to be on guard against discarding too quickly the idea of a possible inherited state, especially in view of Webster's experimental demonstration that animals can be bred with special susceptibility to specific types of infection.

The more one studies the background of patients with rheumatic fever, the more he is impressed with the fact that over rather long periods of time significant events have occurred which result in preparing the ground for the final insult that induces this peculiar disease. Paul's important observations in the histories of rheumatic families have furnished quite convincing proof that years of recurring upper respiratory diseases and mild borderline conditions have existed in many patients before they suffered the first clear-cut attack of rheumatic fever. Practically the only cases of rheumatism observed in very young infants have occurred where the mother had the disease during the time the child was in utero; this suggests that the susceptibility, as well as the infectious agent, were transferred to the infant during the period of pregnancy, because, in general, other infants in rheumatic families do not show clinical evidence of the disease until after the fourth or fifth year of life. It does not seem unreasonable to postulate that during a considerable portion of this pre-rheumatic period the youngster's tissues become so conditioned that they finally develop the capacity for showing true rheumatic lesions. Then, as these children are more and more exposed to infection, by coming into intimate contact with others in school and playground, the incidence of disease rises until toward the period of puberty when a distinct degree of resistance appears. It is during the last half of the first decade of life that the chronic nature of rheumatic fever is especially noticeable, as is shown by the prolonged period occupied by a single attack and also by the great tendency to yearly relapses in this age group.

Another pre-rheumatic condition requiring attention is malnutrition. Many rheumatic children have fairly prolonged periods of undernutrition, often with gastrointestinal disturbances, before developing acute attacks of rheumatism. Mellany felt that he had adduced evidence of vitamin A deficiency; and Rinehart makes similar claims for a low vitamin C intake. Others consider that a general state of undernutrition is a more plausible explanation. One might also suggest that the malnutrition was often a symptom of a chronic rheumatic infection in which other diagnostic symptoms had remained below the clinical horizon, because the weight curve is one of the important signs of the state of resistance in a patient with active rheumatic fever. In any event, we may accept chronic nutritional disturbances as an important factor in the life history of this disease.

The foregoing pathological, familial, environmental and nutritional background supporting a conception of the chronic nature of rheumatic fever can be effectively complemented by the results of clinical observations after its onset. The usual arthritic symptoms are acute or subacute, and disappear earlier than do signs of visceral activity. This is particularly true in children. The therapeutic action of antirheumatic drugs has, moreover, removed arthritis from the list of easily detected signs of chronicity.

Whether we shall regard chronic rheumatoid arthritis as a prolonged stage of rheumatic fever is still a moot point which we shall avoid discussing in detail at this time. Suffice it to say, that in some patients apparently clear-cut rheumatic fever passes over into a condition indistinguishable clinically from rheumatoid arthritis; and a portion of those with chronic arthritis give histories of one or more attacks of rheumatic fever earlier in life. A small proportion of patients with chronic arthritis also have chronic valvular disease; and subcutaneous fibroid nodules occurring in both forms of rheumatism have numerous points of similarity. For those, therefore, who regard rheumatoid arthritis as an end stage of rheumatic fever, these correlations are additional evidence of the chronic nature of this malady.

Fever is one of the most easily measured signs of infection. It seems superfluous to direct attention to the necessity of forming our judgment on temperatures in a patient uninfluenced by antipyretics; but in view of the fact that fever in this disease is so readily influenced by these drugs, this added word of precaution seems necessary. In many hospitals the custom still persists of discharging patients from the wards while they are under the influence of these remedies, with the mistaken impression

that the disease is being controlled when fever and painful joints are not present. Because self-medication with aspirin, or other analgesics, is a common practice among the laity, the necessity of knowing that the temperature curve is not being artificially depressed when we are searching for signs of continuing infection is worthy of emphasis. While the temperature early in rheumatic fever is liable to be high and accompanied by signs of marked intoxication, that persisting for months or recurring in repeated cycles is usually lower, and the accompanying signs of intoxication may be so mild that there is but little general evidence of continuing activity; hence low grade fever in this period must be detected by systematic measurement with rectal thermometers.

Another peculiarity of patients with chronic rheumatic fever is the relative instability of the heat regulating mechanism. Even though the temperature curve may appear normal while the patient is at rest, an amount of exertion that would have little influence under normal circumstances induces distinct, but low-grade, fever. In youngsters in whom even moderately complete physical inactivity is difficult to enforce, such an exercise-induced low-grade febrile curve may be the chief sign of chronic infection.

A persisting increase in pulse rate out of proportion to the temperature is indicative of chronic infection. In judging the meaning of this sign one must naturally consider the amount of previously existing or permanent cardiac damage, for if it is very marked a normal rate is not to be expected even in the absence of active infection. A persistently high pulse rate may also result merely from prolonged physical inactivity, resulting in poor general muscular tone. In such cases there is a slowing of the rate following properly regulated progressive exercise. It is valuable, therefore, at times, to subject the patient to a therapeutic exercise test when the only sign of persisting infection is an abnormally high pulse rate.

During the period of chronic rheumatic activity the physical signs arising directly in the heart do not change rapidly. With progressive valvulitis the murmurs may become more intense. Improved myocardial action, on the other hand, may intensify preëxisting murmurs. A falling diastolic blood pressure often indicates an increasing insufficiency of the aortic leaflets. In the presence of other evidence of active infection, signs of congestive failure point to active rheumatic myocarditis. In electrocardiograms, made at fairly frequent intervals, prolongation of A-V conduction time, and changing shapes in the waves in the direction of abnormality, are presumption signs of myocarditis. Shapiro has observed numerous instances of suddenly appearing abnormal electrocardiograms in children during the year following discharge from the wards where they had suffered from acute symptoms of rheumatic fever. Recently the routine making of electrocardiographic records in the Irvington House for Cardiac Children has revealed an unexpectedly large incidence of active myocardial lesions among children in whom it was thought the disease had come to a standstill. Levy and Turner have observed cases where electrocardiographic signs of myocarditis preceded other visceral or arthritic symptoms by months. It seems, then, that the electrocardiograph is a very useful instrument in demonstrating chronicity of rheumatic activity.

Attention has already been drawn to the chronic nature of subcutaneous fibroid nodules. These are not mere clinical curiosities, but occur more frequently than we were formerly led to believe. While they often accompany obviously severe types of infection, in other instances the patient having them feels perfectly well, and will not submit to the necessary period of forced invalidism unless the physician impresses upon him the importance of complete rest so long as there are such evident signs of active rheumatism.

Another easily detected manifestation of continuing rheumatic poisoning is erythema marginatum. This is so apparently innocuous that it may be overlooked entirely unless the patient and physician understand its significance and search for its presence daily. Giving rise to neither itching nor burning it is detectable only by inspection; and because it occurs largely on the trunk the patient's skin must be well exposed if the correct dermatological diagnosis is to be made. Once the patient's interest has been aroused in keeping track of its occurrence his observations are of much value. Several of our rheumatic subjects have noted that this peculiar rash has appeared weeks or months before they sickened from more acutely severe manifestations of the disease, and they have also observed that other mild general symptoms were often accompanied by marginate erythema after they were discharged from the wards. We have not observed this rash in rheumatic patients in the absence of other signs of activity; and general improvement has often been heralded by a diminution in the intensity of the erythema. I do not mean to imply that this dermatosis is always indicative of active rheumatic fever, but that when it occurs in one who has had this disease its recurrence indicates chronicity of the rheumatic process.

All of the above-mentioned signs of persisting rheumatic infection, with the exception of those derived from electrocardiograms, can be detected by accurate bedside observation. Two other confirmatory manifestations are also useful: leucocytosis and accelerated erythrocyte

sedimentation rate. Neither of these is of absolute value, but they must be judged in connection with other evidence. After the initial moderately high leucocytosis accompanying the acute stages of polyarthritis, there is a fall in the number of white blood cells; but with persisting infection they often range between ten and fourteen thousand. Renewed activity is sometimes heralded by a rising leucocyte curve. Because antirheumatic drugs influence the number of circulating leucocytes to a marked degree, their enumeration in patients taking these remedies has relatively less value. In some cases, where drugs are not being employed, the leucocyte curves are approximately normal even in the presence of other evidence of chronic rheumatic activity.

The erythrocyte sedimentation rate, on the other hand, is less readily affected by drugs, and in the experience of many observers has proved of great value as an indicator of persisting infection. In practically none of our patients has the rate fallen to normal until the third month after the onset of the disease, and in most of them it has remained in the abnormal zone for much longer periods. Because this test is so easily made it should be applied in all instances where there is any doubt of the presence of continuing rheumatic infection, for with it the chronic nature of the underlying process is brought out with striking clarity. Naturally, the interpretation of any given reading must be made with due regard to concomitant conditions; and non-rheumatic factors that might unduly accelerate the rate must be eliminated from the picture before one can be certain that an abnormal rate is indicative of persisting rheumatic infection.

In passing, I might mention that the routine documenting of the various symptoms and signs of rheumatic fever on suitable record sheets has proved of great value to us in correlating their significance. By inspecting a concrete picture of the presence, absence or recurrence of the various manifestations of this disease in chart form, one is in better position to judge of their comparative value than if he attempts to rely upon his memory or a few written notes.

A final factor of chronicity deserves more than passing mention, namely, that of susceptibility to recurrence of the disease. The liability to multiple attacks of rheumatic fever has been long noted, and more recently emphasized by accurate statistical studies. Whether relapses are the results of repeated fresh infections with a hypothetical virus, or are evidence of renewed activity of an infectious agent that has remained dormant in the body during the periods between attacks, is, as yet, undecided. Many of the advocates of the streptococcal etiology of this disease base their theories on the hypothesis that streptococci act on a peculiarly conditioned soil to induce the special symptoms of rheumatism. Whether this special conditioning has been brought about by previous streptococcal infections, or by some other agent, remains for the future to decide. Nevertheless, the opponents of the streptococcal theory cannot deny the close connection between rheumatic fever and streptococcal infections. Too many instances of the disease are preceded by tonsillitis or nasopharyngitis to neglect the connection. Admittedly, other forms of injury seem, at times, to initiate an attack; but upper respiratory affections certainly play the major rôle in this respect.

In this connection the influence of chronic susceptibility comes into the picture, for, in so far as statistical evidence is of value, the following relationships exist. Among non-rheumatic persons, between the ages of five and thirty years, who suffer an acute attack of tonsillitis, or severe sore throat, only about 10 per cent may be expected to develop clear-cut evidence of rheumatic fever; on the other hand, among persons of a similar age group, who have previously had rheumatic fever, a bout of tonsillitis, nasopharyngitis or scarlet fever may be expected to induce a new attack of rheumatic fever in at least *fifty to sixty per cent* of instances. No matter how one may interpret these phenomena, their public health aspects should not be neglected. In hospitals, outpatient departments, schools, and families, where rheumatic individuals occur in unusual numbers every effort should be made to shield them from infection with hemolytic streptococci, for even now we have enough records to show the seriousness of severe upper respiratory infections among these individuals. A few special institutions have recognized the importance of this phase of the rheumatism problem, but there is need for a wide extension of these prophylactic measures in both institutions and private practice.

SUMMARY

In summary it may be stated that while the classically recognized symptoms and signs of rheumatic fever are often acute and severe, and apparently the only ones detectable in some patients, there occur, in most cases, additional features pointing to chronicity.

The following manifestations are indicative of this chronicity:

The granulomatous nature of the typical pathological lesions; a familial or inherited background; prolonged low-grade fever and high pulse rate; an apparent instability of the heat regulating center; persisting or recurring arthritis; subcutaneous fibroid nodules; erythema marginatum; progressive and persistent valvu-

litis. Additional signs of chronicity may be obtained from such laboratory evidence as abnormal electrocardiograms, persisting leucocytosis, and accelerated erythrocyte sedimentation rates. A long persisting tendency to recurrences or to new attacks of rheumatic fever is found in individuals who have once suffered from the disease, and upper respiratory infections in such patients are much more liable to be followed by rheumatic fever than is the case in normal individuals.

Because chronicity in a disease or in susceptibility to that disease indicates chronic measures for its treatment or prevention, it is necessary to be on the lookout in each case for manifestations indicating chronicity so that when they occur, suitably prolonged therapy can be applied.

DISCUSSION

CHAIRMAN MINOT: Three gentlemen have been kind enough to say that they would discuss Dr. Swift's paper. They are Dr. Paul D. White, Dr. Stansfield, and Dr. T. Duckett Jones. Dr. White.

DR. PAUL WHITE: We are very fortunate in having heard this authoritative and comprehensive paper by Dr. Swift, and we are very grateful to him for having addressed us to-day. Many of us can recall that during the past fifteen years there has been a gradual change in the viewpoint from that of considering rheumatic infection as an acute illness to that of rheumatic infection as a chronic disease, and yet, even now we err on the side of omission of proper care rather than of commission of too much care. Probably more in the hospital clinics than in the private offices, but I dare say quite frequently in both, we are very apt, especially if the patients are children, to ask them to return to us at a certain time interval after we have seen them with an uncertain indication of illness. We suspect rheumatic infection, or we may find definite rheumatic infection. These children may come back to us from time to time showing signs of activity of infection. We should have these children under observation, either at home in bed, or in a hospital.

Then too, these apparently well children with chronic rheumatic heart disease may come back at a certain time, having been told to do so, when the weather is very severe, in a storm, in the winter, and thereby catch a cold which may precipitate a new rheumatic attack. On the other hand, although it is safer to err on the side of excessive caution, it is poor medical practice to show excessive zeal and fear in prolonging the bed treatment and convalescence of these patients unnecessarily, and especially in labeling every young person rheumatic simply because of some illness or infection of unknown cause, or because of slightly elevated pulse, or temperature of the so-called psychogenetic type. In these doubtful cases, full studies for rheumatic activities should be made as outlined by Dr. Swift to-day, at intervals, and no sweeping blanket rule of, for example, six months in bed, prescribed arbitrarily at once.

Finally, there are two questions, more or less allied, that I would like to ask Dr. Swift. First, is there usually a distinction between the rheumatic rheumatism of the young adult and that of the child, the former being perhaps of shorter duration and less serious, even though often very painful? And secondly, is it not true that, as a rule, the younger the child, for example, four years in contrast to twelve, when the rheumatic involvement first appeared, the more serious it may be and the greater the heart damage?

CHAIRMAN MINOT: Before I ask Dr. Swift to answer those questions, I will ask Dr. Stansfield to discuss the paper.

DR. OLIVER H. STANSFIELD: Of course I am perfectly in agreement with Dr. Swift that acute rheumatism or rheumatic fever is a chronic disease. Dr. White's remark on six months as an arbitrary rule reminds me that at the present time I have in a hospital a young woman of twenty-three who was admitted to the hospital early in December. She had a history of rheumatic fever at six, rheumatic fever at fourteen, and again in December she developed a mild attack, with the highest temperature of 100°. Her pulse rate would sometimes stay persistently between 90 and 100. I have been very, very cautious, perhaps overcautious as Dr. White suggests, but in my mind the question persisted, was this a third attack of rheumatic fever, or was it a recurrence of the same disease that she had when she was six?

I am inclined to draw an analogy with tuberculosis. A child can have a particular form of tuberculosis, be apparently healthy and well, and yet in adult life, under strain, have an adult type of tuberculosis. We are wise enough now in tuberculosis to say, not cured, but arrested, and I have a feeling that perhaps we would be on safer ground, when an acute attack of rheumatic fever has passed by, to say that it is arrested, with the mental reservation that we have to be careful.

Some two weeks ago a young boy stopped me on the street and said, "Do you remember me?"

I told him that I was sorry but I didn't.

He said that he was so-and-so, and then I remembered him. He was a boy that I had had in the hospital for something over three months with chorea. When he left he was apparently free from all rheumatic disease. I asked him how he was getting along, and he replied, "I have gotten along very well until about four or five weeks ago, and since then I have had an ache down in my leg." Now are those growing pains? Or is it the same disease?

There is another question which presents certain possibilities. Once I encountered a man whose sole symptoms of rheumatic fever were an aching in one of his great toes, of temporary duration less than twelve hours. He had mitral stenosis.

There are a lot of problems in this disease, the recurrence, and then again, in the mild, almost unrecognizable disturbance. I do have, I will admit, almost a standard rule that if I can prevail upon patients to stay in bed in a hospital for three months, I keep them there. If I can keep them longer when it is necessary, I will. That is the way I like to do with these cases.

CHAIRMAN MINOT: Dr. Jones will now discuss this paper.

DR. T. DUCKETT JONES: This very important phase of rheumatic fever has interested me very much over a period of five or six years. It is important to impress this from a practical point of view, especially to those physicians caring for patients with rheumatic fever outside of hospitals or institutions. Even in general hospitals one is impressed with the acute phases of this disease rather than the chronic.

It may be well to mention also, that in teaching and caring for these patients, far more attention is directed to the interpretation of murmurs than to the question of the presence or absence of active

rheumatic fever. This, from the patient's point of view, is the most important consideration, since active rheumatic fever is responsible for increase in organic heart disease.

The signs and symptoms of continued rheumatic fever have been amply covered by Doctor Swift. That the duration varies in each case is well known, and this duration is not predictable at the onset.

It is not uncommon to see only one laboratory finding as the evidence of continued active infection. We often find, for instance, a prolongation of conduction time by electrocardiogram, and there may be little other evidence of active disease. I personally feel that this is sufficient to indicate prolonged rest, but many physicians feel that it is not justifiable to so treat the patient. One cannot be a therapeutic nihilist, but I should welcome Doctor Swift's opinion as to how insistent we should be in our directions in handling this problem of a seemingly well patient, with probable low-grade, chronic rheumatic fever.

It may be well also to mention that it requires very little to bring to a clinical level, symptoms of rheumatic fever in a patient who is asymptomatic but with laboratory evidence of the disease. This may be produced by a number of incidents such as tooth extraction, accidents, operations, etc., and in fact any incident which causes fever. Respiratory infection is, of course, the more common incitant.

In closing, I should like to stress one point mentioned by Doctor Swift. This concerns anti-rheumatic drugs. That these drugs depress temperature and white blood counts is well known. In considering the question of the presence or absence of active rheumatic fever, both of these measures are helpful. Normal temperature and white blood counts in a patient receiving medication such as salicylates would be of no value. This is an often disregarded fact.

CHAIRMAN MINOT: Dr. Swift's paper is now open for general discussion. I am sure he would be glad to answer questions that anybody may wish to ask. As there are no further questions, will you please close the discussion, Dr. Swift?

DR. SWIFT: I agree with Dr. White that it is impossible to formulate an arbitrary rule concerning the length of time necessary for treatment of a patient with rheumatic carditis, except that treatment should be continued as long as there are signs of persisting infection. Such signs require painstaking and continued searching for their detection, for they are not the same in all individuals. Rest is a very important element in the treatment of a patient with rheumatic carditis, for in few infections does the element of trauma play so important a rôle. A rheumatic heart is specially prone to undue acceleration under the stimulus of moderate physiological demand. For example, a short walk will induce an increase in rate from 90 to one of 110 or 120 beats per minute. If, now, we postulate that with each impact of the valves there is a small injury in addition to that resulting from the rheumatic process, it is easy to estimate the relative total increase in trauma that would result from this extra exertion. Over the course of weeks or months this total might easily determine the difference between much or little permanent scar formation in the heart valves. It seems to be a general rule that the rheumatic poison apparently attacks those parts that are specially subject to motion. Any means, therefore, that can be applied to reduce the amount of motion would be indicated in order to hold the eventual damage to the lowest possible level. I realize quite well the practical implications of this advice, but I would like to impress upon you that we have as yet scarcely scratched the surface of measures for supplying suitable facilities for the treatment of any of the rheumatic conditions when compared with what has been done for patients with tuberculosis, even though the importance of the problem appears to be equally pressing.

The differences between rheumatic fever in children and adults are important in more than one respect. In youngsters the process is usually more persistent during a single attack and there is greater liability to recurrences. About the age of puberty a condition of greater resistance seems to develop; and this brings up the contrast between the seriousness of the disease in a child of four and one of twelve. The former before reaching puberty has ten years during which he is very likely to have relapses; the latter only two. By this I do not mean to imply that the sixteen year old does not need to be protected, but rather to contrast the liability to repeated rheumatic insults at various ages.

The question has been raised as to whether in any individual who has recovered we shall consider the disease as merely arrested or completely eliminated. We shall have to hold the answer in abeyance until we know more about the true nature of the rheumatic process. While I have been painting this dark side of the picture, I would like to direct your attention to the brighter aspect. Over the course of a number of years one is impressed with the ability of many patients, having severe rheumatism, to experience complete and apparently permanent recovery. Because of this ability in many people, each case deserves careful study in an attempt to discover the factors that contribute to recovery, for with a knowledge of them, doubtless more patients could be led into a comfortable and useful life.

CHAIRMAN MINOT: We are all, I am sure, very much indebted to Dr. Swift for coming here from New York to speak to us.

Before we proceed with the next paper, I will present the report of the Nominating Committee. The Committee nominates for Chairman, Dr. Francis M. Rackemann, of Boston; and for Secretary, Dr. Richard P. Stetson, of Boston. I would ask what is your pleasure concerning these nominations. If some one would move that the Secretary cast one ballot for the election of these gentlemen, I think our business would be completed.

MEMBER: I move that the Secretary cast one ballot for the election of these gentlemen.

MEMBER: I second that motion.

CHAIRMAN MINOT: It has been moved and seconded that the Secretary cast one ballot for these gentlemen who have been nominated. That has been done and they are elected as the officers of this section for the coming year.

Unfortunately, Dr. Chadwick, who was to have read the next paper, has been called to Washington on business. However, he has been kind enough to have his associate, Dr. Alton S. Pope, present his paper. Dr. Pope will now present Dr. Chadwick's paper, "Tuberculosis as It Affects the Physician's Practice."

TUBERCULOSIS AS IT AFFECTS THE PHYSICIAN'S PRACTICE*

BY HENRY D. CHADWICK, M.D.†

PULMONARY tuberculosis is a disease that every physician meets with in his practice. He cannot escape it by restricting his work to any line, as tuberculosis may be an associated condition with any other disease. Since 1910 the death rate in Massachusetts from this disease has dropped from 158 to 53 per 100,000, but even now it causes 4.6 per cent of all deaths in the State. The total number of deaths from all forms of tuberculosis in Massachusetts in 1932 was 2301, of which 1193 were males and 1008 females. This makes the rate per 100,000 for males 62 and for females 46. It is reasonable to assume that there are ten cases of tuberculosis, counting all forms, in the community for each death. We can estimate, therefore, that there are 23,000 individuals with some form of this disease now living in the State. About 4000 are in State, county, municipal and private sanatoria or on waiting lists for these institutions. It is not possible to estimate how many are being cared for by physicians, but doubtless there are at least 10,000 that have not yet been diagnosed, or two to each registered physician in the State. We can get some help in finding these cases by studying the incidence of the disease in different groups according to age and sex.

Tuberculosis still remains the leading cause of death in the years 15 to 40, but the impression is quite general that when an individual has passed the age of 45 the tuberculosis danger line has been crossed. A reference to the accompanying graph will show, however, that the death rate for males rises continuously from its low point at age 5 to its peak at 70. For females the low point, also at age 5, rises quite rapidly to a peak in the early twenties, and is followed by a moderate drop in the 40 to 60 group, and again rises to a second peak in the seventies. In other words, a man who has reached the age of 65 to 70 is more likely to die of tuberculosis than he was at any earlier period of his life. The chance of a woman at ages 70 to 75 dying of tuberculosis is almost as great as at age 25.

The death rate is higher during the first ten years of life for males than for females. In the next twenty years the "Grim Reaper" removes more females than males, but this is more than compensated for in the years after thirty for then he gathers in a greater harvest of males. When the final score is cast up, it is always found that the males have suffered more than the females as a result of tuberculosis.

*Read before the Section of Medicine of the Massachusetts Medical Society, at its Annual Meeting, Worcester, June 5, 1934.

†Chadwick, Henry D.—Massachusetts State Commissioner of Public Health. For record and address of author see "This Week's Issue," page 234.

INFANCY

The peak in infancy is largely due to the meningeal form of tuberculosis. There were 149 deaths under 15 years from all forms of tuberculosis in Massachusetts in 1932; of these, 50 per cent were from tuberculous meningitis. Of the 100 deaths from tuberculous meningitis, 64 were under five years of age, 10 were between 5 and 14, or 74 per cent were under 15.

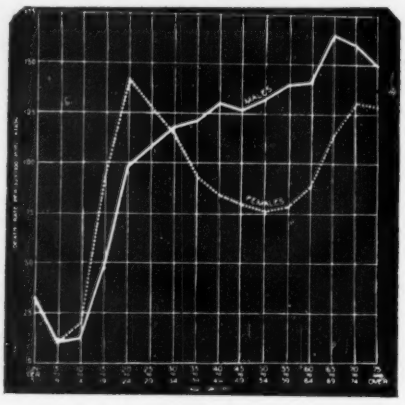

FIGURE I.
Tuberculosis Death Rates by Sex and Age. United States Registration Area, 1927.

How may this mortality from tuberculous meningitis be avoided? No treatment has been evolved that has the slightest beneficial effect. Rarely a proved case has recovered, but the mortality is substantially 100 per cent. Our resources, therefore, should be directed toward the prevention of infection with the tubercle bacillus. The sources of infection available to the infant are tuberculous persons in the home and milk from tuberculous cows. The latter can be eliminated by pasteurization of the milk and the eradication of bovine tuberculosis. The tuberculous mother or other person in the household should be removed to a sanatorium for treatment so that contact with the child is broken. When the city of Detroit provided enough beds to care for all tuberculous patients promptly on application, the deaths from tuberculous meningitis were immediately lessened. This was demonstrated by comparing the three years during which there was a long waiting list with the three-year period subsequent to obtaining adequate hospitalization facilities and eliminating the waiting list. Instead of having an average of 122 deaths each year from this disease, the number dropped to 72 and has remained at about that level. A decrease of 50

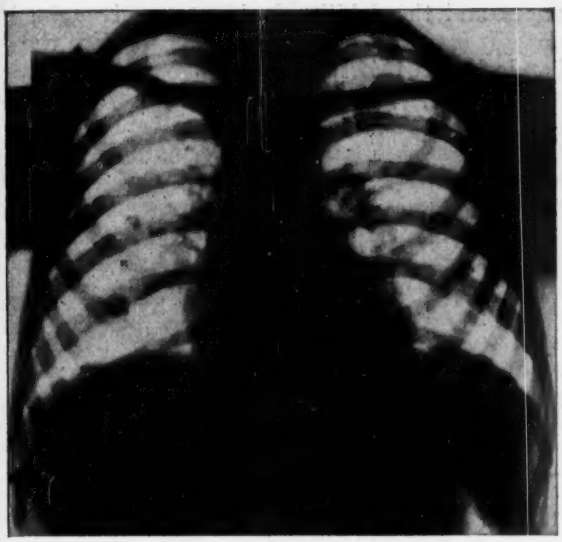

FIGURE II.

CHILDHOOD TYPE OF TUBERCULOSIS.

Children with the so-called childhood type of infection are as a rule relatively well, and go ahead with their normal school work and other activities. They may or may not, of course, have subsequent active tuberculosis. This is a type of picture which we frequently find in the school child. You will see there is probably some calcium here (pointing) and certainly a calcified nodule out in the right lung field just above the diaphragm (pointing). Now that child may go along perfectly well, or may get a reinfection, and in the course of anywhere from one year up to six or eight or even ten years may, for one reason or another, have a breakdown, and the process will spread and become the adult type of disease.

deaths, or 40 per cent, was achieved promptly by removing infectious cases from contact with young children.

ADOLESCENCE

A study by Pope[1] of the data obtained from the Massachusetts school clinics shows that al-

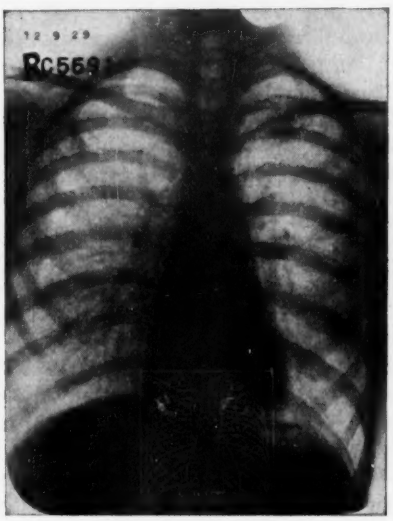

FIGURE III.

DEVELOPMENT OF PULMONARY TUBERCULOSIS IN CHILD OF TEN.

Here was a child who was examined in the Westfield Sanatorium, Outpatient Department, in 1929. At that time he had no signs or symptoms. This shows two areas here (pointing) just below the clavicle on either side with slight infiltrations, apparently a perfectly well child otherwise. The distribution of lesions is shown graphically on this little insert.

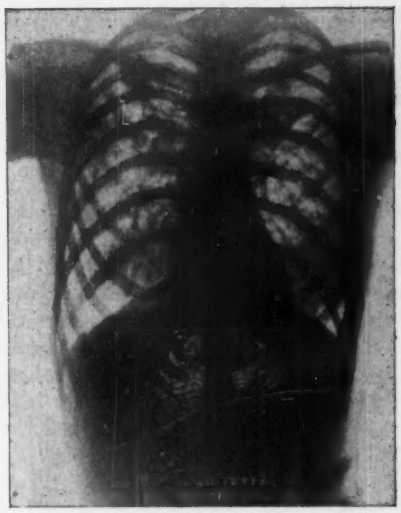

FIGURE IV.

This child was treated in the sanatorium for about three or four months and then was discharged by the local Board of Health for financial reasons. He came back to us in November, 1933, with the picture you see here, and the history was that only within two or three months of this second film was the child showing any signs or symptoms of tuberculosis. This went on to a fatal issue in a comparatively short time, but until within two or three months the child was going along in the community, attending school, apparently a well child. The only thing he showed was a slight loss of weight and occasional night sweats.

though the rate of infection for boys and girls is the same for the ages 5 to 18, pulmonary tuberculosis is found in increasingly greater proportions in infected girls than in infected boys. In the 10 to 14 year group, the incidence of pulmonary infiltration is 1.5 times as high and in the 15 to 18 year group three times as high in girls as in boys of the same age. He esti-

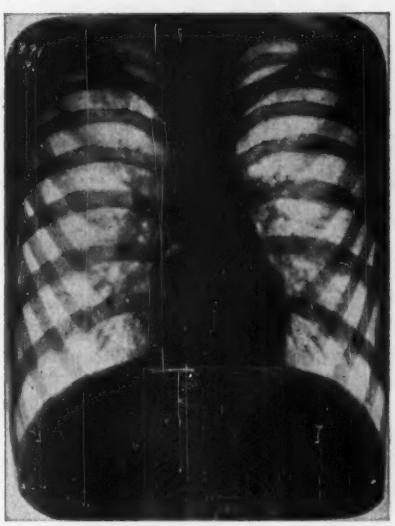

FIGURE V.

PULMONARY TUBERCULOSIS IN A GIRL OF TWELVE.

This was a girl of twelve who was picked up in a school clinic in routine examination in June, 1926. At that time she showed this light area of infiltration below the right clavicle. Otherwise she was a perfectly well child, recommended for sanatorium treatment simply on x-ray findings. She showed no loss of weight, no fatigue, no symptoms, no physical signs. The family did not take the condition seriously. The child was sent to the country for a couple of months for recuperation and gained weight, came back and went into school.

mates that if the morbidity found in a study of 100,000 school children is representative of the State as a whole, then there are at least 1,800 cases of pulmonary tuberculosis in Massachusetts children between the ages 5 to 18. Zacks[2] has found that an average of three years elapses between the x-ray diagnosis of pulmonary tuberculosis and the appearance of clinical symptoms. Two or three more years are passed after symptoms appear before the death of the patient. It is evident, therefore, that much of the adolescent tuberculosis remains hidden and is carried over to appear as active disease and a cause of death in later years.

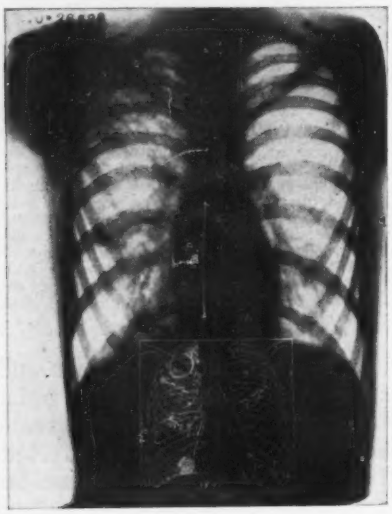

FIGURE VI.

And this is the picture in October, 1928, a little over two years later, with marked infiltration involving practically all the upper lobe, and this cavity which you see at the right apex, and the story is that the child had been well until six weeks before she was brought in for this examination. And that is the sort of thing we see happening repeatedly with this type of tuberculosis in children. The only way these things can be found out in children, except in the advanced stage, is by routine x-ray examination.

TUBERCULOSIS IN BOYS AND MEN

The physiological changes incident to puberty appear about three years later in boys than in girls. At age 15 to 16 boys gain in weight and grow in height very rapidly. It is at this period that the morbidity and mortality from tuberculosis begin to be manifest as shown by admissions to sanatoria and in the vital statistics.

The stress of industry, especially marked in occupations that expose men to irritating fumes, dust, and extremes of temperature, furnish conditions favorable for the development of pulmonary tuberculosis. New infections may develop from close association with tuberculous fellow workmen, old lesions that have lain dormant for years are stimulated into activity, and the disease spreads through tissues whose normal defences have been weakened or destroyed.

Besides the occupational diseases with their definite hazards, there are the degenerative changes and the debility incident to advancing years. It is conceded that an infection with the tubercle bacillus, if it does not produce serious disease, increases slightly our immunity to tuberculosis. This resistance, however, is only relative and does not afford a dependable protection at any time. The bacilli will be held in subjection only so long as the resistance is in the ascendant. Tuberculosis of elderly people in most instances is due to the reactivation of a smoldering focus acquired in early life. The factor of resistance is at an ebb with the other vital forces, is finally overcome, and fatal tuberculosis results.

TUBERCULOSIS AS FOUND IN SAMPLES OF THE POPULATION

In 250,000 elementary school children examined in the Massachusetts school clinics, the number of cases of childhood type tuberculosis found was one in 75, and of pulmonary tuberculosis one in 1,200.

In 35,368 high school students, pulmonary tuberculosis was found in 1 in 400 examined.

In 1932 a roentgen study was made of 250 school teachers by the Michigan Tuberculosis Association in the smaller communities of the state. Two per cent of this group were found to have pulmonary tuberculosis. A year later 1000 more teachers were x-rayed and ten found to have pulmonary tuberculosis. This shows the need of an annual roentgenogram of school teachers in order to protect the children under their care from tuberculosis.

About four years ago I studied the incidence of pulmonary tuberculosis in 400 women admitted to the obstetric service at the Herman Kiefer Hospital. Roentgenograms were taken of consecutive patients admitted. Four per cent were found to have pulmonary tuberculosis. As sixty per cent of these patients were colored women, this probably shows a higher incidence than would be found in an all white group.

A study was made of the student nurses in the entering classes of seven general hospitals in Detroit. Two hundred and fifty-four students were given a tuberculin test and a chest roentgenogram was made of each one. Thirty-seven and seven tenths per cent reacted positively to tuberculin and 1.1 per cent were found to have pulmonary tuberculosis.

Martin, Pessar, and Goldberg[3] in a recent study of 2,000 food handlers in New York City showed 2.3 per cent with active pulmonary tuberculosis on roentgen examination.

Root[4] in a recent article reported tuberculosis as an associated condition in 6.6 per cent of 1,503 diabetic deaths.

In a study made by the Massachusetts Commission on Industrial Diseases in 1933, it was found that 3.5 per cent of 1,609 foundrymen and 9.1 per cent of 961 granite workers had pulmonary tuberculosis.

From this evidence we can conclude that a physician comes in contact with approximately two cases of pulmonary tuberculosis in every 100 adult patients that come to his office or are admitted to a hospital. Many are not recognized as such because they exhibit no symptoms of pulmonary disease and therefore are not examined for tuberculosis. Even if given the usual physical examination by auscultation and percussion no abnormal signs would be found in many cases. Pulmonary tuberculosis may be an associated condition with a more obvious disease or injury and therefore is often overlooked. This is especially true in the adolescent group. Not only the early case but occasionally the disease progresses to an extensive involvement without cough, sputum, fever, weakness, or loss of weight. In fact, boys and girls, more often the latter, may be normal in weight, have good color, be taking a prominent part in athletics, and have active pulmonary tuberculosis. All the characteristics of good health may mask this serious disease. With adults it is more often the chronic fibroid type that is deceptive. Such a case may or may not cough or raise sputum. If there is sputum, it is considered to be due to sinus disease, bronchitis, asthma, or cigarettes. All patients who raise sputum should have specimens examined for tubercle bacilli. If this were done routinely for all patients who consult a physician, many more cases of tuberculosis would be discovered and in a much earlier stage.

Furthermore, the unrecognized case, if a spreader of bacilli, is a menace to the family and the community. It is important, therefore, that the hidden case be brought to light. In only one way can this be done. We must take advantage of the improved methods of diagnosis.

Diagnosis should be made promptly. Tuberculosis oftentimes progresses rapidly and a delay of even a few weeks may make a difference between a minimal and an advanced case and between recovery and death of the patient. In a study made by the National Tuberculosis Association of a group of sanatorium patients, it was found that an average of five months elapsed between the first symptom noted by the patient and the first consultation with a physician, and an average of another five months passed before the patient was told he had tuberculosis. Ten months elapsed between the patient's first symptoms and the definite diagnosis. This accounts for the few patients reaching the sanatorium in the minimal stage of the disease. It also accounts for the high case fatality of tuberculosis.

There are two essential diagnostic procedures that should be used in every person examined for pulmonary tuberculosis. These are, a roentgenogram of the chest and an examination of the sputum. If the first specimen of sputum is negative, others should be examined. These two procedures, plus a good history as to symptoms, will determine the presence of disease and furnish evidence as to the activity of the process. Auscultation may give signs that are indicative or confirmatory, but not conclusive, and the use of the stethoscope should be considered only as a procedure supplementing the roentgen examination. That the roentgenogram is expensive will be the objection raised by some. The best answer to that is that delay in diagnosis is much more costly. Furthermore, if all physicians make a practice of relying on a roentgenogram for diagnosis for pulmonary disease, the cost can be greatly reduced. Shock-proof x-ray equipment is now developed to such a degree that portable units can be obtained for use at the bedside or in the office. Soon the fluoroscope and the film will replace percussion as a means of determining intrathoracic densities and become routine procedure in office practice. When that time comes we will really have early diagnosis of pulmonary tuberculosis.

For differential diagnosis we now have important aids in clearing up puzzling conditions simulating tuberculosis. Iodized oil will enable us to separate cases of bronchiectasis from tuberculosis. The bronchoscopist can give invaluable aid in locating pulmonary abscess and bronchiogenic carcinoma. With these resources at our command, there is no need of a "wait and see" policy in diagnosis. I have known tuberculosis patients to be classed as suspect and held under observation for four years, when one x-ray at the patient's first visit would have revealed the true condition. Other persons have been considered tuberculous for years who never had the disease.

TREATMENT

This has been revolutionized within five years. No more important advances ever have been made in any branch of medicine than have taken place in the treatment of pulmonary tuberculosis. To bed rest have been added pneumothorax, phrenic nerve surgery, and thoracoplasty to collapse the diseased area in the lung and give it a better chance to heal. Collapse therapy should be considered in every case of pulmonary tuberculosis. It has a wide field of application. Broadly speaking, some form of collapse is of benefit in every case except those that are very minimal in area or at the other extreme, far-advanced progressive cases, too ill to respond to any treatment. Rest is the basis of all successful treatment, and the sooner it is applied to the diseased lung the better the prospect of cure. If there is a cavity it should be closed as soon as possible to prevent the spread of bacilli to healthy portions of the same lung or to the opposite lung. Collapse therapy will accomplish this very promptly in

many cases and put the lung in the best possible condition for healing. About 75 per cent of patients when first found to have pulmonary tuberculosis are suitable for pneumothorax or phrenic nerve surgery to supplement the bed rest that each one should have.

Much experience is needed to decide which method should first be tried and the facilities of a sanatorium or hospital are essential that the operative measures may be performed most effectively. Accessibility to an x-ray is an absolute necessity to check up on the effect of the installations of air. Fluoroscopic examination before and after each refill is important to graduate the amount of collapse throughout the course of treatment, to judge when refills are needed, the effectiveness of the collapse, when to initiate other procedures, and watch the condition of the opposite lung. Furthermore, some cases with or without small cavities should be treated by phrenic nerve surgery in preference to pneumothorax. All these questions require the judgment that can be attained only by years of experience and should be left to the specialist in pulmonary tuberculosis. Much harm will be done to patients if pneumothorax is started and the lung allowed to expand too soon. Adhesions may form in such a case and make it difficult or impossible to re-establish the pneumothorax. Therefore, pneumothorax should be instituted and continued with the patient under sanatorium care if possible, but in any event only by a physician skilled in this form of treatment who realizes its benefits, its limitations, and its dangers. When to do a phrenic operation or a thoracoplasty should be decided upon by the combined judgment of the clinician and the thoracic surgeon. The successful thoracic surgeon is one with a knowledge of the pathogenesis of pulmonary tuberculosis plus special training in the surgical treatment of the disease. It is not a place for a general surgeon to learn at the expense of the patients. He should first serve a sufficient time with a master of this special field of surgery. Otherwise, the mortality will be high and thoracic surgery will be discredited.

SUMMARY

The diagnosis of pulmonary tuberculosis can be made quickly in most cases by x-ray and sputum examination. No patient with any pulmonary symptoms should be classed as a suspect and carried as an observation case without first resorting to these procedures. All available methods needed for differential diagnosis should be used promptly. Delay in diagnosis is dangerous to the patient and a reproach to the physician. Tuberculosis should be considered a possibility in any person and given consideration even if the patient is under treatment for another disease or an injury. When a diagnosis of pulmonary tuberculosis is made, collapse therapy is the treatment that will give the patient the best chance of recovery. The physician assumes a very grave responsibility who does not advise his patient to seek such treatment. Delay of even a few weeks may in the end be fatal to the patient. The sanatorium is the place of choice for such treatment, but in any event a specialist should carry out the collapse therapy procedures. Tuberculosis is a public health responsibility like the other communicable diseases. Prompt reporting of cases to the local health department is very important. The examination of contacts to determine the source of the disease in a given case should be routine procedure. That is particularly true in the case of children found tuberculous. Every child who has tuberculous meningitis usually means a nearby open case of pulmonary tuberculosis. It should be searched for to prevent other tragedies within the family circle. That is the physician's responsibility as well as his opportunity to further the cause of preventive medicine and public health.

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3 Martin, D. C.; Pessar, H. T., and Goldberg, J. A.: Tuberculosis among food-handlers. New York City. Am. Rev. Tuberc. 29: 182 (Feb.) 1934.
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DISCUSSION

CHAIRMAN MINOT: Dr. Paddock, of Pittsfield, has kindly consented to open the discussion.

DR. BRACE W. PADDOCK: *Mr. Chairman and Members*—The day is far spent and there is much to do. There are a few things that I would like to go over in the hope that some of the general practitioners might be interested in them. You have just heard that in the last year there were reported some 3500 cases of tuberculosis. That means that many of us do not see many cases of this trouble, and it behooves us especially to pay attention to such a paper as Dr. Chadwick has given us this afternoon. The matter of early diagnosis has been greatly stressed, and it cannot be overemphasized. We cannot make such diagnoses from looking at their tongues, or from taking their temperatures or from the physical signs, for if we rely on the physical signs we will miss one out of six cases of tuberculosis. We cannot live without the x-rays, or rather I should say we cannot practice in the tuberculous field without the x-rays. How often we are amazed at the amount of trouble that is shown by the x-ray, when there are very few or no physical signs. This is especially true among children, and we should remember the great prevalence of tuberculosis among girls of the high school age, that they are often well-nourished, that by the time the tubercle bacillus appears in the sputum it is moderately advanced, and over fifty per cent are found by x-ray alone.

One of our great sins is that of omission in that we do not examine the contacts of the case of tuberculosis. These cases must be x-rayed and very carefully watched and repeatedly x-rayed. Most of

us are very well pleased to have made a diagnosis of early tuberculosis, forgetting entirely the importance of the other examination of the contacts. The state will help in the x-ray examinations of these people through their various sanatoria.

I would like to recall to you the excellent papers that were published by Dr. Howard Root on the association of tuberculosis and diabetes; that tuberculosis does not predispose to diabetes, but that diabetes is very apt to predispose to tuberculosis. The stealthiness with which the disease of tuberculosis develops in the presence of diabetes brings attention to the fact that very few cases are diagnosed. Many of the cases are older patients because sixty per cent of the diabetics are over forty years old, and the cases who have had coma seem very prone to develop tuberculosis and should be very carefully watched and very carefully x-rayed.

And finally, the figures of Dr. Lord, who says that there are at least a thousand cases of adult tuberculosis, and some 18,000 cases of childhood tuberculosis in Massachusetts, demonstrate that the battle is not yet won.

CHAIRMAN MINOT: Would anybody else like to discuss this paper? It seems to me it is a very important subject. Dr. Paddock brought out one point which impresses me very much. Often we see a case in which we take an interest in the family history or in the history of persons who live with the patient. But how often do we exert ourselves to try and encourage those individuals, especially when the history suggests they are "all well", to seek out their doctor and find out whether they, too, exhibit any evidence to suggest tuberculosis? I think if we would try more often to have individuals who have had any contact with tuberculosis carefully studied by their doctor, we would prevent more tuberculosis, and it would lead to a still lower death rate.

If there is no more discussion, this meeting will now be adjourned.

The meeting adjourned at 5:10 p. m.

COMPARISON OF DISEASE INCIDENCE IN CONNECTICUT WITH 1933 AND SEVEN YEAR AVERAGE

MONTH ENDING JULY 21, 1934

	1934					1933			
Diseases	Week ending June 30	Week ending July 7	Week ending July 14	Week ending July 21	Average cases reported for week corresponding to July 21 for past seven years	Week ending July 1	Week ending July 8	Week ending July 15	Week ending July 22
Cerebrospinal Men.	1	—	1	—	1	—	—	1	1
Chicken Pox	78	35	40	42	19	64	75	43	29
Diphtheria	3	1	—	2	11	4	2	6	7
Dysentery Bacillary	2	1	—	2	—	—	—	—	—
German Measles	1	6	1	2	3	2	2	1	—
Hookworm Infection	—	—	—	—	—	—	—	1	—
Influenza	—	2	3	—	2	1	1	4	1
Malaria	—	—	2	—	—	—	—	—	—
Measles	105	118	65	44	65	99	58	38	40
Mumps	25	21	36	19	14	23	10	27	18
Paratyphoid Fever	—	—	1	—	—	—	—	—	2
Pneumonia (Broncho)	10	4	8	6	11	10	14	6	7
Pneumonia (Lobar)	7	5	8	7	11	9	6	8	6
Poliomyelitis	1	—	1	—	2	2	—	1	2
Scarlet Fever	12	14	12	7	14	33	23	9	25
Septic Sore Throat	4	3	1	1	1	2	2	—	1
Tetanus	—	—	—	1	—	—	—	—	—
Trichinosis	—	3	—	—	—	—	—	—	—
Tuberculosis (Pul.)	22	20	33	28	29	25	21	30	13
Tuberculosis (O.F.)	1	2	3	6	3	1	1	1	4
Typhoid Fever	—	1	1	—	2	1	—	5	2
Undulant Fever	3	1	1	—	—	1	—	—	—
Whooping Cough	72	59	70	63	49	31	38	37	41
Gonorrhea	28	18	17	94	33	22	14	31	21
Syphilis	49	59	19	88	28	46	25	32	27

Remarks: No cases of Asiatic cholera, glanders, plague or yellow fever during the past seven years.

NEW ENGLAND SURGICAL SOCIETY

RUPTURE OF THE INTERVERTEBRAL DISC WITH INVOLVEMENT OF THE SPINAL CANAL*

BY WILLIAM JASON MIXTER, M.D.,† AND JOSEPH S. BARR, M.D.†

DURING the last few years there has been a good deal written and a large amount of clinical work done stimulated by Schmorl's[1] investigation of the condition of the intervertebral disc as found at autopsy. His work will stand as the most complete, painstaking and authoritative that has ever been done in this condition. This work, however, is purely pathological and it now remains for the clinician to correlate it with the clinical findings and apply it for the relief of those patients who are disabled by the lesion.

FIG. 1. A normal intervertebral disc. Note cartilage plate, anterior and posterior longitudinal ligament, annulus fibrosus, and the semifluid nucleus pulposus which bears the superincumbent body weight and is retained in place under pressure by the annulus.

In the routine examination of spines from autopsy material he discovered that the intervertebral disc is often involved in pathological changes, the most common one being prolapse of the nucleus pulposus into an adjacent vertebral body. He found one or more such prolapses (Knorpel-knochen) in about thirty-eight per cent of the spines examined. He also discovered that in about fifteen per cent of the spines there were small posterior prolapses beneath the posterior longitudinal ligament, but concluded that they rarely, if ever, produced clinical symptoms. He attributed their presence to weakening of the annulus fibrosus by degenerative changes, with mild trauma as a second factor, producing fissures in the annulus and escape of the semifluid nuclear material.

On the other hand, for a number of years clinicians have been reporting cases of spinal cord pressure from intervertebral disc lesions.

*Read at the Annual Meeting of the New England Surgical Society, September 30, 1933, at Boston.

†Mixter, William Jason—Visiting Surgeon, Massachusetts General Hospital. Barr, Joseph S.—Orthopedic Surgeon to Out-Patients, Massachusetts General Hospital. For records and addresses of authors see "This Week's Issue," page 234.

In 1911 Goldthwait[2] reported a case of sciatica and paraplegia which he attributed to a posterior displacement of the intervertebral disc at the lumbosacral junction and suggested that such displacements might be the cause of many cases of lumbago, sciatica, etc. Middleton and Teacher[3] report a similar case confirmed at autopsy. Elsberg[4] in 1916 mentions chondroma of the vertebrae as causing compression of the cauda equina and states that Oppenheim has described a similar case. Mixter[5] in 1921 mentions a similar case and numerous other re-

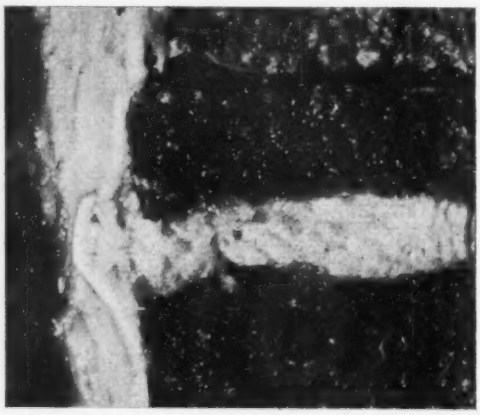
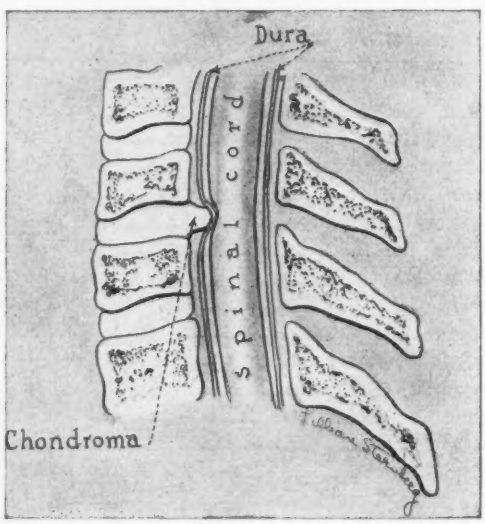


FIG. 2. Autopsy specimen. CASE 5. Note small posterior prolapse such as Schmorl describes.



(FIG. 17. Showing the usual location of a ventral vertebral disc chondroma. [Legend in *Surgery, Gynecology and Obstetrics*].)

FIG. 3. Illustration taken from article by Elsberg, showing "chondroma" arising from intervertebral disc. (Elsberg: S. G. & O.; 46: 10: 1928.

Case Number		Age	Sex	Location of Lesion	History of Trauma	Symptoms	Signs
1	H. L.	37	M	C_3-C_4	Negative.	Bilateral paresthesias in ulnar distribution.	Stiff neck. Hypesthesia to pinprick from nipple line downward and in ulnar distribution of hands.
2	W. A.	39	M	C_4-C_5	Negative.	Numbness and stiffness in legs. Difficulty in urination and defecation. Pain in neck.	Mild spastic paraplegia. Hypesthesia to pinprick in ulnar distribution of both hands and from manubrium downward.
3	R. D.	50	M	C_5-C_6	Sudden onset while lifting a weight.	Numbness and tingling of fingers and legs. Stiffness of legs. Constipation.	Spasticity of legs. Increased reflexes. No definite sensory changes.
4	E. R.	28	M	C_5-C_6	Negative.	Stiffness of legs. Numbness of fourth and fifth fingers, bilateral.	Spasticity of legs. Increased reflexes. Positive Babinski. Ulnar hypesthesia.
5	M. P.	53	F	D_4-D_5	Negative.	Numbness and stiffness of legs. Incontinence.	Complete sensory and motor paraplegia.
6	A. N.	63	F	D_6-D_7	Negative.	Pain in legs and around abdomen. Inability to walk.	Hyperesthesia of legs and abdomen. Spasticity of legs. Increased reflexes.
7	M. M.	42	M	D_8-D_9	Negative.	Numbness of legs. Increasing difficulty in walking. Back pain.	Hypesthesia below umbilicus. Spasticity of legs. Increased reflexes in legs.
8	A. S.	56	M	D_{11}-D_{12}	Negative.	Pain in back, thighs and legs. Unsteady gait. Numbness of legs. Incontinence.	Spasticity of legs. Increased reflexes. Hypesthesia of feet and buttocks.
9	E. G.	24	M	L_2-L_3	Sudden onset while lifting a weight.	Pain and stiffness in back and legs. Weakness of legs.	Inability to walk. Flaccid paralysis (partial) of both feet. Hypesthesia of both legs over sciatic distribution.
10	J. D.	37	M	L_4-L_5	Fell fifteen feet at age of seventeen, landing on feet and buttocks. In hospital one month.	Pain in lower back. Numbness and weakness of legs.	Marked motor weakness of legs. Back motions markedly limited. Ankle jerks absent. Saddle anesthesia.
11	T. D.	29	M	L_4-L_5	Buried by shell explosion several years before entry.	Numbness of perineum. Severe back pain. Incontinence of urine and feces.	Generalized motor weakness of legs. Saddle anesthesia. Incontinence.
12	L. C.	20	M	L_4-L_5	Severe fall of seventy-five feet five years before present illness.	Low back-ache. Pain down right posterior thigh and calf.	Spine listed forward and to left. Lumbar kyphos. Sensation normal. Reflexes normal.
13	P. P.	44	M	L_4-L_5	Negative.	Pain in lower back. Pain down right posterior thigh and calf, worse on coughing.	Sensation normal. Weakness of muscles of both legs, right worse than left. Back motions markedly limited. Ankle jerks absent.
14	K. N.	25	M	L_5-S_1	Ski fall one month before present illness.	Pain in lower back, left posterior thigh and calf.	Lumbar kyphos, trunk listed forward. All motions of lower back limited. Left ankle jerk absent.
15	I. B.	36	F	L_5-S_1	Ether manipulation for "slipped sacro-iliac".	Urinary incontinence. Numbness of buttocks. Pain down left posterior thigh.	Saddle anesthesia. Sural anesthesia of left foot. Question of positive Babinski, left. Urinary and rectal incontinence.
16	A. V.	48	M	L_5-S_1	Negative.	Pain in lower back radiating down left leg laterally and posteriorly.	Tenderness over whole lower back. Trunk listed forward and to the right. Straight leg raising limited. Sensation and musculature normal.
17	J. A.	41	M	L_5-S_1	Twisted back by slipping off running board of car. Immediate pain.	Midlower back pain radiating down both posterior thighs.	Stands with knees flexed, spine stiff and lumbar kyphos. Tenderness at lumbosacral junction. Left ankle jerk absent.
18	B. R.	?	F	L_5-S_1	Negative.	Low back pain radiating down left posterior thigh.	Sensory disturbance; hypesthesia of left side of vulva, thigh and lateral aspect of foot. Stiff back. Straight leg raising limited.
19	E. S.	35	F	S_1-S_2	Negative.	Pain in buttocks, anus, and vulva. Pain down left thigh posteriorly. Incontinence of urine and feces.	Saddle anesthesia of perineum and buttocks. Sphincter paralysis. Legs essentially normal.

TABLE 1

Spinal Fluid		X-Ray Examination		Operation
Evidence of Block	Total Protein	Local Changes	Lipiodol	
Partial at first examination; complete at second examination.	47 82	None of consequence.	Block.	Cervical laminectomy. Remo of extradural mass from between C_3 and C_4.
Partial.	74	None of consequence.	Block at C_5.	Cervical laminectomy. Remo of extradural mass from between C_4 and C_5.
Partial?	33	Spur formation.	Not done.	Not done.
Partial.	52	Narrow disc. Spur formation.	Block at C_5-C_6.	Cervical laminectomy. Remo of extradural mass from between C_5 and C_6.
Partial?	37	Calcification in disc between D_4 and D_5.	Not done.	Not done.
Partial.	67	Hypertrophic changes. Narrow disc.	Block at D_6-D_7.	Dorsal laminectomy. Remo of extradural mass from int vertebral disc, compressing s nal cord.
Partial. (Complete?)	114	No films.	Not done.	Dorsal laminectomy. Piecem removal of mass from interv tebral disc, compressing spi cord.
Partial.	Increased. (Alcohol and ammonium sulphate tests.)	No films.	Not done.	Dorsolumbar laminectomy. moval of tumor from disc tween D_{11} and D_{12}, compressi cord.
Partial?	204	No films.	Block at L_2-L_3.	Lumbar laminectomy. Remov of extradural mass from int vertebral disc, pressing on co
None.	75	None?	Block at L_4-L_5.	Lumbar laminectomy. Remov of extradural intervertebral di mass, compressing cauda equi
Complete.	70	?	Block at L_4-L_5.	Lumbar laminectomy. Remov of extradural intervertebral di mass, compressing cauda equi
Partial?	75	Biconcave L_4 and L_5 vertebral bodies.	Negative.	Lumbar laminectomy. Remov of extradural intervertebral di mass pressing on right L_4 ro
None at L_5, first examination; almost complete at L_5, second examination.	174		Block at L_4-L_5.	Lumbar laminectomy. Fr mass found extradurally moved. Probe could be pass into the middle of the disc.
Partial.	108	None of consequence.	Not done.	Lumbar laminectomy. Extr dural mass pressing on left root removed.
			Block at L_5-S_1.	Lumbar laminectomy. Remov of mass compressing cau equina, arising from the int vertebral disc.
Partial.	67	None of consequence.	Negative.	Laminectomy with removal pea-sized extradural tumor co pressing left L_5 root.
None.	83	Narrowing of disc. "Lumbosacral arthritis."	Not done.	Laminectomy with removal small tumor pressing on cau equina. Spinal fusion.
Partial at first examination; complete at second examination.	62	?	Complete block at L_5-S_1.	Laminectomy. Removal of e tradural mass compressing le L_5 and S_1 roots.
None.	140	None of consequence.	Negative.	Lumbosacral laminectomy. R moval of tumor arising betwe S_1 and S_2, compressing lowe fibers of cauda equina.

	Histology of Tissue Removed	End Result
v. Removal from disc	Annulus fibrosus.	Back at work. Much improved.
v. Removal from disc	Annulus fibrosus.	Much improved.
		Died at home. Autopsy showed tumor arising from disc between C_5-C_6, compressing spinal cord and causing ascending and descending tract degeneration.
. Removal from disc	Annulus fibrosus.	Much improved.
	Nucleus pulposus.	Died of pernicious anemia. Autopsy revealed a small posterior prolapse of the disc between D_4 and D_5, which was degenerated and contained calcium.
Removal from inter- ressing spi-	Nucleus pulposus.	Complete motor and sensory paraplegia. Unrelieved.
Piecemeal n interver- ing spinal	Annulus fibrosus and nucleus pulposus.	Complete paraplegia. Unrelieved.
tomy. Re- n disc be- ompressing	Annulus fibrosus and nucleus pulposus.	Died seven months after operation; cause unknown. Slight postoperative improvement in symptoms.
Removal rom inter- g on cord.	Annulus fibrosus.	Improved. Motor and sensory changes are slowly disappearing.
Removal tebral disc da equina.	Annulus fibrosus and nucleus pulposus.	Much improved. Slight residual motor and sensory changes.
Removal tebral disc da equina.	Nucleus pulposus.	Much improved. Walks with a cane. Does light work.
Removal tebral disc nt L_4 root.	Annulus fibrosus and nucleus pulposus.	Completely relieved.
v. Free urally re- be passed e disc.	Annulus fibrosus.	Relieved.
. Extra- on left L_4	Annulus fibrosus.	Completely relieved.
Removal ng cauda the inter-	Nucleus pulposus.	At first much relieved subjectively and objectively. Pyelitis followed by uremia and death five months after operation.
emoval of umor com-	Annulus fibrosus and nucleus pulposus.	Completely relieved.
emoval of on cauda .	Annulus fibrosus and nucleus pulposus.	Relieved.
val of ex- ssing left	Annulus fibrosus?	Completely relieved.
omy. Re- g between ng lowest	Annulus fibrosus and nucleus pulposus.	Dead. Wound infection; septicemia; pyemia.

UNIV. OF MICH.

ports by Elsberg[6], Stookey[7], Bucy[8], Petit-Dutaillis and Alajouanine[9], and others have come into the literature. Thus the enchondroma, chondroma or ecchondroma arising from the intervertebral disc has become, to the neurosurgeon at least, a well-recognized lesion to be treated by excision and with a distinctly favorable prognosis. Dandy[10] in 1929 reported two cases from which he had removed loose cartilaginous fragments protruding extradurally into the spinal canal. He considered them "undoubtedly traumatic" in origin.

Our interest in this group of cases was stimulated particularly by a case seen by us two years ago in which the main symptoms were referable to root pain and in which the tumor was situated in the intervertebral foramen without cord or cauda equina compression of any moment.

Investigation of the cases of spinal cord tumor treated at the Massachusetts General Hospital and in our own private practice has shown a surprisingly large number of these lesions, classified as chondromata, to be in truth not tumors of cartilage, but prolapses of the nucleus pulposus or fracture of the annulus. We have attempted to review these cases and differentiate true neoplasm and masses caused by rupture of the disc. We find as a result of this review that nineteen of our cases are rupture of the disc and six are true cartilaginous tumor or unclassified.

Clinically these cases of disc rupture, particularly the more recent ones, are of considerable interest. Diagnosis has been made difficult and operation has been delayed in them on account of the indefinite nature of the symptoms and signs and their similarity to those found in various conditions such as back strain, arthritis, sacro-iliac disease, etc.

A summary of all cases of ruptured intervertebral disc is shown in table 1. For the purposes of this article abstracts of two cases will suffice.

CASE 4: On February 6, 1933 a white married chauffeur, aged 28, was admitted to the Massachusetts General Hospital. He gave a history of gradually increasing stiffness of his legs, noticed chiefly in walking, and of increasing numbness of the fourth and fifth fingers of each hand. The onset was insidious about six months before admission. He had been treated for cerebrospinal syphilis for three months.

P. H.: Essentially negative. There was no history of serious trauma.

P. E.: Showed definite hypesthesia over the ulnar distribution of each hand and very mild sensory disturbance of the trunk extending downward from the level of the nipples. There was definite spasticity of the legs with hyperactive knee and ankle jerks, bilateral ankle and patellar clonus, bilateral positive Babinski sign. Biceps and triceps reflexes were also increased.

Combined cistern and lumbar puncture was done. There was alteration in the dynamics in the lower needle indicative of a partial block. The total protein of the fluid from the cistern was 17, and of the lumbar fluid 52. If 40 milligrams be considered the upper limit of normal, then the lumbar fluid shows definite elevation in total protein. By injection of 2 cubic centimeters of iodized oil into the cisternal needle the block was localized at the level of the intervertebral disc between the fifth and sixth cervical vertebrae. Note that in the lateral view (fig. 4) the block is shown, and that the intervertebral disc

FIG. 4. Lateral x-ray of cervical spine showing partial lipiodol block at C 5-6 disc. CASE 4. Note the narrowed disc and early hypertrophic changes.

is narrowed and there are hypertrophic changes present. After some delay the oil passed the point of obstruction and descended into the lower end of the dural sac. The patient was then placed on a fluoroscopic tilt table, head down. Another x-ray showed that the return of the iodized oil to the cistern was blocked at exactly the same point as on its descent.

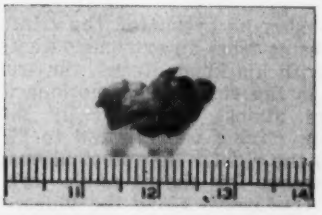


FIG. 5. Photograph of specimen removed at operation. CASE 4.

Cervical laminectomy disclosed a spinal cord compression by an extradural encapsulated fibrocartilaginous mass 1.5 x 0.8 x 0.3 centimeters in size. The tumor lay in the midline in front of the cord and was exposed by rotating the cord and incising the anterior dura. It was easily removed from the underlying intervertebral disc.

Microscopic examination of the mass showed a homogeneous matrix containing elastic fibers and occasional cartilage cells. There was no evidence of malignancy.

CASE 14: A twenty-five year old white man was admitted to the Massachusetts General Hospital June 15, 1932 complaining of pain and stiffness in his left leg of two years' duration. A few months before the onset the patient sustained a severe ski fall, but had no immediate disability. He noticed at first only mild discomfort in his back and the posterior portion of his left thigh, but it increased gradually until he was unable to work. The pain radiated down the posterior thigh, calf and into the heel. There was a little discomfort in the other leg. He finally consulted one of us, who treated him with adhesive strapping and corset to support his back, with a tentative diagnosis of low back strain. He spent several months in absolute recumbency on a Bradford frame without relief. On account of lack of improvement it was decided to institute a complete neurological investigation.

On admission he presented the clinical picture of a man suffering from an extremely acute back strain. He stood with his knees flexed, the trunk listed forward and to the right. The motions of the lumbar spine were almost abolished by muscle spasm. Straight leg raising was limited to 25° on the left and 80° on the right. Neurological examination was negative except for absent ankle jerk on the left. There was tenderness along the course of the sciatic nerve, especially in the sciatic notch.

Lumbar puncture showed questionable partial block and a definite elevation in the total protein to 108 milligrams. Lipiodol examination was negative.

On June 29, 1932 an exploratory laminectomy from the second lumbar to the first sacral inclusive, was done. After prolonged search a mass one centimeter in diameter was found in the intervertebral foramen pressing on the left fifth lumbar root and displacing the cauda equina to the right. It was removed piecemeal from the intervertebral disc and the wound was closed. Recovery was complete and uneventful. He had complete relief from pain immediately after the operation and has remained well since his recovery from the operation.

Pathological examination of the specimen showed it to be composed almost wholly of dense eosin staining fibrous connective tissue characteristic of annulus fibrosus. The original report classified this specimen as a chondroma.

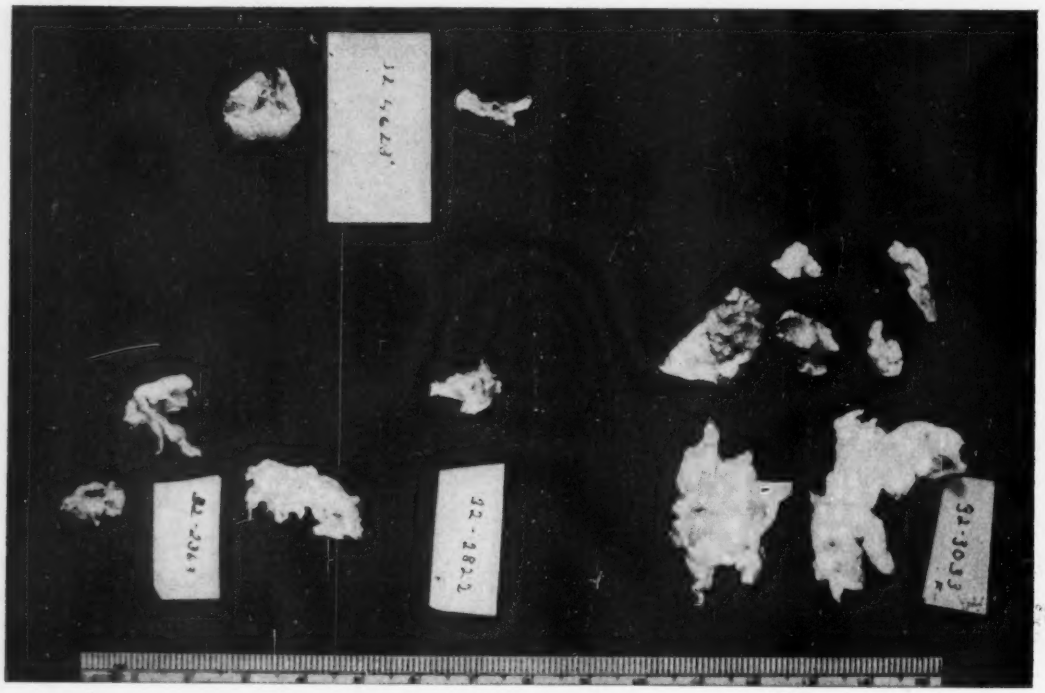


FIG. 6. A group of specimens taken from cases of this series.

The symptoms and signs of these so-called chondromata, which we believe in most instances represent rupture of the intervertebral disc, have been discussed at length by Elsberg and Stookey. The symptoms depend entirely on the location and size of the lesion. There is often a history of trauma not immediately related to the present condition. Numbness and tingling, anesthesia, partial or complete loss of power of locomotion, are usually present. Bladder and rectal sphincters may be involved. The condition of the reflexes varies with the level of the lesion. If it is compressing the cauda equina the tendon reflexes may be absent; if higher, compressing the cord, the legs may be spastic and the reflexes exaggerated with positive Babinski sign. If the lesion is low in the spine, the physical examination may be suggestive of low back strain or sacro-iliac strain. X-ray examination may be entirely negative, but narrowing of the intervertebral space is often present and is of significance, as it ordinarily

means escape of the nucleus pulposus, not necessarily but possibly into the spinal canal. Lumbar or combined puncture and lipiodol examinations are of real value. If the mass is large, a partial or complete block is demonstrable at the level of the lesion. The spinal fluid rarely contains more than one or two cells, but the total protein in all of our cases was elevated moderately.

It so happens that most of the cases in this group have been operated on by one of us (W. J. M.) and not by a large number of surgeons; therefore we have developed certain ideas as to the operation when we suspect this lesion to be present. Exposure of the spine and laminectomy are performed as usual except that the laminectomy is narrow and on the side where the lesion is suspected, for we believe that a ruptured disc is a weakened disc and the strength of the spine should be preserved as much as possible. The dura is opened and the spinal canal carefully explored, particular attention being given to the intervertebral discs in front of the cord and the intervertebral foramina. If the lesion is found in the midline it is approached by incising the dura over it as suggested by Elsberg. If it is lateral, the dura is closed and the dissection carried out to the side between the dura and the bone. If a lesion is suspected in the intervertebral foramen it may be necessary to carry the removal of bone well out to the side, even taking in part of the pedicle. One must always remember that the tumor may be very small and extremely difficult to find on account of its position in the intervertebral foramen. After the tumor is exposed removal is a simple matter. It frequently comes away without any dissection and if not, section across its base or removal with a curette is bloodless. Though we have done it in only two cases, we believe that it may be advisable to slip bone chips in between the stumps of the laminae before closing the wound, in order to facilitate fusion. After removal of the torn piece of the disc one frequently finds an opening through which a probe or half length may be passed into the nucleus pulposus. An interesting point is the appearance of the specimen before and after removal. The tumor in situ usually has the appearance of a half a pea with its flat side against the intervertebral disc, but as soon as it is removed it tends to unroll and can often be flattened out like a crumpled bit of wet blotting paper or a rolled up piece of fascia. The true chondromata on the other hand are rounded or lobulated masses of almost translucent cartilaginous tissue.

The microscopic picture of these chondromata is quite at variance with that of the normal disc. The chondroma is composed wholly of well-formed cartilage cells. The extruded portions of the intervertebral discs on the other hand

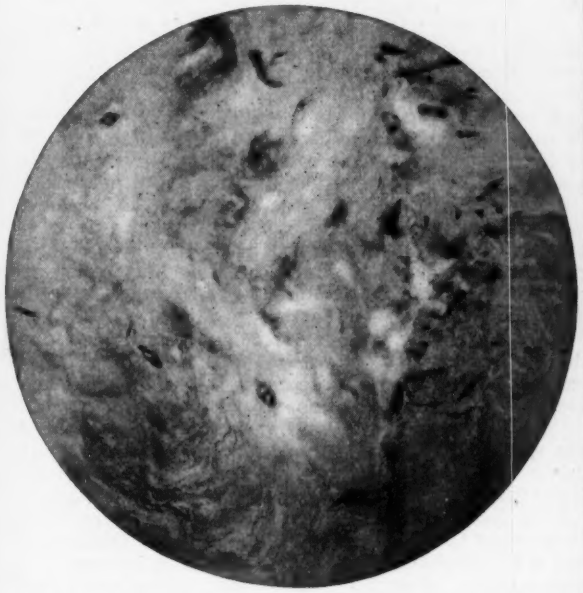


FIG. 7. Photomicrograph of specimen from CASE 12 showing on the left, nucleus pulposus tissue; on the right, tissue characteristic of normal annulus fibrosus.

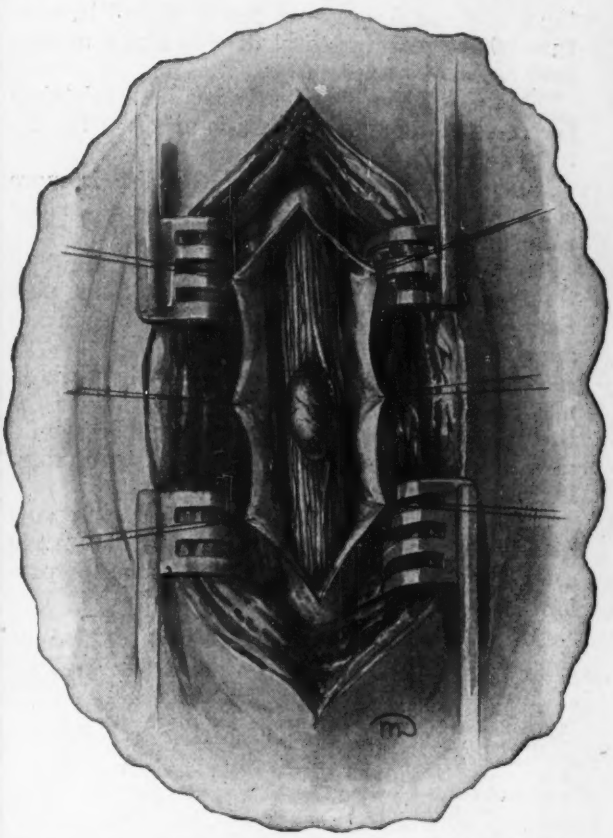


FIG. 8. Drawing of tumor in situ. CASE 10. This illustration is taken from Lewis' Surgery (Prior & Company) in the report of a case of "enchondroma" of the intervertebral disc (W. J. M.). Reëxamination shows the specimen to be normal intervertebral disc tissue.

may have occasional normal cartilage cells, but for the most part are made up of the different elements of the annulus fibrosus and nucleus pulposus, such as very poorly differentiated atypical cartilaginous cells scattered irregularly in a very granular and loose reticulum. The compactness of a true chondroma is not seen in this group.

We conclude from this study:

That herniation of the nucleus pulposus into the spinal canal, or as we prefer to call it, rupture of the intervertebral disc, is a not uncommon cause of symptoms.

That this lesion frequently has been mistaken for cartilaginous neoplasm arising from the intervertebral disc.

That in reality rupture of the disc is more common than neoplasm; in our series in the ratio of three to one.

That this lesion should be borne in mind in the study of certain orthopedic conditions, particularly in those cases which do not respond to appropriate treatment.

That a presumptive diagnosis may be made in many instances and that operation whether for this or for supposed spinal cord tumor should always be planned with the possibility of finding this lesion.

That the treatment of this disease is surgical and that the results obtained are very satisfactory if compression has not been too prolonged.

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NOTE: Since the reading of this paper before the New England Surgical Society in September, 1933 we have obtained G. Mauric's monograph on the intervertebral disc published in Paris by Masson et Cie in 1933.

This monograph covers many of the points touched upon in this communication. It is a most complete and exhaustive study of the subject and includes a voluminous bibliography.

It is interesting to note that his deductions are drawn from exhaustive studies and review of the literature while ours are from a small group of personal cases. Notwithstanding this difference of attack, our conclusions are in substantial agreement. Anyone interested in this subject is advised to read this monograph which is too long and complete to be reviewed here.

DISCUSSION

DR. JOSEPH BARR (By invitation): *Members of the New England Surgical Society*—I appreciate the privilege of being allowed to have a part in the presentation of this paper. Dr. Mixter has operated on almost every one of the cases and I have been primarily interested in the orthopedic aspects of some of them. It is worth while to stress the anatomy of the disc, as it is almost impossible to appreciate what appears in these lesions without knowing the anatomy.

(Figure 1.) The annulus fibrosus is a fibrocartilaginous semi-elastic tissue which completely incloses the nucleus pulposus. The nucleus pulposus is composed of remnant cells from the notochord in a semi-gelatinous matrix containing elastic fibrils. In the adult the water content of the nucleus is 75 to 90 per cent, which means that it is a semi-fluid mass and if the annulus is injured, either from trauma or degeneration so as to produce a break in its continuity or weakening of the wall, the nucleus pulposus will herniate or extrude. If the extrusion takes place posteriorly into the vertebral canal or either intervertebral foramen, symptoms of spinal cord or root pressure are thus produced.

Dr. Benjamin Castleman, Resident Pathologist at the Massachusetts General Hospital, and I have compared the histology of the material removed at operation from eighteen cases with the histology of intervertebral disc and we have found that seven of the specimens represent purely annulus tissues, four cases nucleus pulposus only and seven contained elements of both annulus and nucleus pulposus.

It is interesting to note that in ten of the nineteen cases the lesion was either between the fourth and fifth lumbar vertebrae or the fifth lumbar and the sacrum. Every one of these cases had some clinical symptoms and signs which are associated with back strain, i.e., sciatic pain, low back pain, stiff back with limitation of straight leg raising, etc. In other words, they were cases which clinically resembled lumbosacral or sacro-iliac strain, and several of them were treated under this diagnosis for a considerable period of time. I know of no way of accurately ruling out intervertebral disc lesions in cases of low back strain with sciatica by clinical examination. If the patient fails to respond to correct orthopedic treatment, the case certainly warrants complete neurological examination and lumbar puncture. If the total protein is elevated or there are signs of block, either partial or complete, a lipiodol injection and finally a laminectomy may be the only means of settling the diagnosis.

DR. ERNEST L. HUNT, Worcester, Mass.: I think we cannot be too grateful for work like this which will help us to clear up some of the distressing back conditions which so disable people and so often are shoved into the category of neurosis.

I can't add anything to this excellent presentation from personal experience, but the importance of it is clear to all of us. The approach in removing those particles is not wholly clear to me. I want to learn a little more about the subject by asking Dr. Mixter to tell us if he is able ever to get them by displacing the dura, not going through the dura.

I should think there might be a question as to when we should consider that lesion important enough or large enough to justify the rather severe

operation of laminectomy; that is to say, are there instances in which the extrusion is small and in which with the passing of time nature would take care of it without the necessity of operation with its attendant risk, which apparently was five per cent in this group?

Clearly, to be able to get down and do something for this distressing result of back injury is very worth while. The newer methods of neurological investigation afford valuable help in the diagnosis of these conditions and I think we may draw from this paper a stimulation to make more careful and more thorough investigations before we decide we can't help very much.

Dr. Philip D. Wilson, Boston, Mass.: I believe the paper by Drs. Mixter and Barr represents an important contribution and I am only sorry that the limitation of time did not permit them to present some of the aspects of the subject in greater detail. Naturally I am interested in the orthopedic aspects of the subject, and it is from this angle that I shall discuss it.

One of the common problems of orthopedic practice is the treatment of patients with so-called sciatic pain. We make an investigation of such cases, and in some we find extraspinal or intrapelvic causes, while in others we find evidence of disturbances of the sacro-iliac joints of a type sufficient to account for the symptoms. But there remains a group of cases in which we are in great doubt as to the cause, and the management of which represents a problem. We have turned to our neurological friends for help, and they have generally been able to assure us there was no evidence of intraspinal tumor.

The work of Drs. Mixter and Barr has, however, begun to shed new light on this problem. Gradually with the accumulation of cases in which spinal punctures have been performed, one finding has assumed increasing importance, namely, a high total protein. Combined cistern and lumbar puncture has shown the high protein concentrated at the lower lumbar level. In some of these cases a rupture of the intervertebral disc between the fifth lumbar and the sacrum has been demonstrated at operation with sufficient protrusion of the disc to cause pressure on the spinal nerve.

I believe these lesions are more common than we have supposed and now that we know how to look for them we will find them more often. A narrowing of the intervertebral disc can generally be demonstrated by x-ray, and a history of traumatic onset of the symptoms is also suggestive together with signs of impaired mobility of this segment of the spine.

Dr. John Homans, Boston, Mass.: I should like to ask in my ignorance why protrusion of an intervertebral disc should cause pain upon one side and, if it does, why operation should be of any value whatever. I can't get that through my head.

Dr. Donald Munro, Boston, Mass.: I should like to add my voice to the chorus of praise for Dr. Mixter's and Dr. Barr's work in presenting adequate information so that somebody else can get a chance to make new diagnoses.

I have had no personal experience with this matter. There are one or two points that I believe have been covered in their full paper and in which I am particularly interested. One is how frequently abnormal protein is found in the spinal fluid below the level of these tumors. Another is whether any attempt to relieve the pain by the injection of alcohol has been made. It would also seem to me from what little I know about it, that there must be a good many of the cases where the protrusion is small, it is not perhaps in direct contact with the nerve roots, and where perhaps some less radical procedure than the laminectomy might be expected to give some possible relief.

Dr. William Jason Mixter: I am going to attempt to answer Dr. Homans' question first. A tumor far out to the side of the intravertebral disc will compress the nerve roots as they leave the spinal canal, causing severe root pain. The sheath containing the roots arches over such a tumor in the notch. There is no evidence of block in such a case, but there is increase in protein in the spinal fluid. I do not know why these patients have tenderness along the sciatic nerve. Does that answer your question?

Dr. Homans: Absolutely! Thank you very much.

Dr. Mixter: There have been two or three cases which I have operated on expecting to find the lesion and in which I have had a negative exploration, and those we have not included in this presentation to-day because it seemed to us to confuse the picture. It is a difficult diagnosis to make and we have been wrong several times.

I think in the early cases where diagnosis is uncertain, as it is in many of these cases, adequate orthopedic treatment should certainly be tried out before laminectomy is done. They should be given adequate orthopedic treatment because we are distinctly uncertain as to the diagnosis and only the therapeutic test will tell the story.

I believe that if you give a patient adequate orthopedic treatment short of operative fixation by fusion, you have probably given him a sufficient test to know that a fusion operation will not cure the disability. I may be wrong, but it seems to me if you have given such cases fixation and they still have pain, then you have a right to go ahead and do a laminectomy.

I think fusion should be combined with operation where there is any question of an unstable spine, and I believe that a ruptured disc may be unstable.

TEACHING MEDICAL STUDENTS THE SOCIAL IMPLICATIONS OF SICKNESS*

BY IDA M. CANNON†

THE increasing complexity of the problems of medical education are well recognized. How to find opportunity in the inelastic time limits of the curriculum to present the scientific advances in the knowledge of disease, and, in a busy hospital or out-patient department, how to teach the fine art of medical practice, are some of these problems. The ideals of medicine assume the *practice of the art* by the physician. How this art can be practised within the highly organized institution, the hospital or the busy clinic, is not clear. To one who, from the point of view of an associated profession, has been in a position to observe the situation at close range, it seems as though Medicine were for the time being more or less in the grip of science, at the same time struggling to maintain its great heritage as the most humane of the professions. The *art* of Medicine is not conspicuous in the big hospital or dispensary.

Three publications during the past three years have given us valuable historical documents at this interesting period of transition in medicine: the several Reports of the White House Conference on Child Health and Protection; the Report on the Costs of Medical Care; and that on Medical Education. Each of these envisages a future for medicine which includes not only service to patients, but social responsibilities that profoundly affect the traditional doctor-patient relationship. I quote from the Report on Medical Education:

"Current medical practice has taken on certain characteristics which resemble those of contemporary industrial life. Considerable emphasis is being placed upon organization as a means of providing mass production in medical services. Efforts are made to standardize procedures partly as a reflection of methods in the field of industry. These efforts are based in many instances upon the fundamental fallacy that the human being who is the unit of medical service can be regarded as a uniform, standardized organism. The contrary is known to be the case inasmuch as no two individuals are alike, and no two even with the same disorder react in exactly the same way. Sound medical practice requires careful study of the health needs of each individual—physical, psychic and social."‡ This statement suggests the atmosphere of many of our large hospitals and clinics where so much of the medical education of the doctors of the future is taking place. The difficulty of getting a clear focus on the particular social setting of each patient and a conception of the social forces playing upon him is one of those obvious facts that through familiarity is lost sight of.

The idea of social responsibilities of physicians and some measure of socialization of medical practice is becoming more and more a part of the thinking of the medical profession. The practical question becomes that of how to prepare the medical student, whose training is chiefly confined to large institutions, for the practice of his profession in the spirit of these newer ideals. Such preparation must include not only factual material, but an attitude of mind as well.

Some efforts to accomplish this have been tried out in several medical schools. At a recent meeting of the Association of American Medical Colleges, a brief report was presented on Social Case Teaching of Medical Students* as it has developed in the past twenty years in some of our medical schools. By the term social case teaching is meant the use of the patient in clinical teaching with special focus on the social, environmental, psychological features of the case and the consideration of the relationships of these to the medical condition, diagnosis, prognosis and treatment of the patient.

Dr. C. P. Emerson at Indiana University Medical School in 1912, introduced social case teaching into what he called the "medical-social clinic". In 1913, under Dr. Edsall's leadership, a program for the fourth year Harvard medical students at the Massachusetts General Hospital included the presentation of the social aspects of tuberculosis, heart disease, syphilis, alcoholism, feeblemindedness, occupational disease through social case presentation by physicians and medical social workers. This plan has continued with increasing participation by the student.

More recently the idea of social case teaching has extended beyond these beginnings. At the University of Pennsylvania, the University of Louisiana, University of Minnesota, Western Reserve, Tufts College and St. Louis University social case teaching is now being carried on by coöperation of clinical teachers and medical social workers. At Syracuse University, an interesting experiment has recently been initiated

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‡Final Report of the Commission on Medical Education. P. 22, 1932.

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in the Department of Medicine, taking form in seminars in the social aspects of medicine for the fourth year medical students. The seminar is conducted by the Chairman of Medicine and is attended by the Professor of Sociology, Professor of Hygiene and Preventive Medicine, and by the medical social worker of the hospital. The student prepares a report of his studies of a patient "based on a personal investigation of his heredity, home living and working conditions", which, with a statement of the medical condition, becomes the basis for group discussion.

The Department of Medicine of the Harvard Medical School has officially established social case teaching as a part of its clinical teaching at the Boston City, the Massachusetts General, and the Beth Israel Hospitals for the purpose of interpreting practically the social implications of disease. The methods purposely vary in the different institutions, and are being watched critically by those involved in the teaching. The students are invited to offer suggestions and several constructive criticisms have come from them. The three methods at the three hospitals have a common purpose, but there are significant differences. It is hoped that out of these differences may evolve more satisfactory ways of teaching the social aspects of medicine. But there is common agreement that the integration of the social and clinical teaching is a sound principle.

At the Boston City Hospital under the leadership of Dr. George R. Minot, assisted by Dr. George P. Reynolds, a program has been developed for the third and fourth year students in the study of what is called "Medical Sociology". The third year men have included in their usual clinical teaching three sociological lectures and clinics each trimester. These exercises are conducted by the Professor of Clinical Medicine, assisted by the Director of the Department of Social Work. They consist of a combination of lectures and case demonstrations, the focus of attention being on the social aspects of the patient's condition. The meetings incidentally serve as a demonstration of the function of the Social Department of the Hospital and suggest to the students the way in which they may make intelligent use of these services later.

The fourth year students, during their assignment as clinical clerks, attend a bi-weekly so-called "clinical sociological conference", which is conducted by the Professor of Medicine. The object of these exercises is to acquaint the student with methods of obtaining a social study of the patient and to demonstrate the clinical application of such a study in diagnosis and treatment. A patient is assigned to the student at least one week in advance and he is called upon to present the case. A brief résumé of the medical problem is presented with the patient present. The patient is then returned to the ward and the student gives a brief statement of the prognosis not only for recovery but for ability to resume full or limited activity. Then follows the report of the social study by the student in which he has been instructed to give consideration to the patient's "occupation, financial resources, marital condition, his ambitions, interests, temperamental peculiarities, his attitude toward society and a clear picture of the daily routine of his life." Following the student's presentation, the clinical teacher and the social worker add any significant items that they have obtained, as for instance the facts secured through a full social investigation made by the social case worker, or a report from a social agency that already knows the patient. Discussion brings out the significant features in the situation. This is followed by the presentation by a visiting physician of a parallel case from his private practice, thus bringing out more clearly the physician's responsibility for taking into account the social aspects of a case that are often obscured in the busy teaching clinic or in ward rounds.

The plan at the Massachusetts General Hospital is under the direction of Dr. J. H. Means, and is concerned with the fourth year medical students assigned to the wards as clinical clerks. From a variety of methods which have been tried out through twenty years of social case teaching, the present plan has evolved. Each new group of students is required to prepare a written social case study of a patient whose medical history he has taken. A preliminary conference is held with the students to explain the purpose of this case study and suggestions are made concerning methods of interview with the patient and relatives. The method may best be illustrated by quoting from a report presented by one of the students concerning a patient who had come to the Hospital from another city because of persistent symptoms. He was a married man of 45, American born, with diagnoses of psychoneurosis and secondary anemia; his chief complaint being loss of appetite and weight during the past fourteen months. The history as presented by the student is as follows:

"Patient has been a salesman all his life. Ever since he finished his education after one year in High School he has been steadily employed selling men's clothing. At first he did much traveling, but for the past ten years he has been a salesman. He enjoyed his work, and he had many friends. His job brought him into contact with large numbers of people and gave him a sense of some importance. He took considerable pride in his personal appearance and acquired a moderate amount of social grace as necessary adjuncts to success in his profession.

"Until fourteen months ago, patient earned $35 a week. He lives with his wife, one daughter aged three, the only child, and his mother-in-law in the latter's house which she owns. The house is large, light, and airy, and has a good-sized yard around it.

The patient is very fond of his wife and mother-in-law and adores his daughter. The family relationship is entirely harmonious, and, thanks to the mother-in-law's house, the patient has never had to worry very much about food, clothing or shelter. He is well taken care of at home and lives in very healthful surroundings.

"His cultural interests are extremely limited. He never reads anything more than newspapers and occasional magazines, and he has no activities or interests outside his job and occasional odd jobs around his home. He spends all his spare time sitting around at home doing nothing and does not even care to go to the movies.

"Fourteen months ago the patient returned from a two weeks' vacation with his family in Maine after having spent most of his spare cash, only to find that during his absence his job had been taken away from him. This was a dreadful shock to him, and he was so mortified that he even concealed the fact from his wife as long as he could. He worried terribly about it and was extremely unhappy. For a while he managed to find odd jobs to do at the store, and at the end of two weeks he was given a permanent job running the freight elevator at a salary of $23 a week. He has to work in an enclosed space, sees nobody or nothing except four bare walls around him all day long, and the work of handling the freight is much more strenuous than he has been used to. All his symptoms date from this time. His appetite has been poor, and he has lost a total of 25 pounds up to the present time. Normally cheerful and good-natured, he has become moody, unresponsive, and irritable. His wife says that he sits around at home all evening, without saying a word, often not even answering her questions. He refuses to budge from the house when he comes home from work. He feels deeply humiliated over the loss of his job and is very sensitive about it. He avoids all his old friends because he feels that they look down upon him for losing his job, and he refuses to confide in anyone, even his wife. She has done all she could to cheer him up without success. He is naturally a quiet, retiring and highly sensitive individual, and his demotion at work has accentuated these traits. In addition he exhibits mild ideas of persecution in that he thinks his friends make derogatory remarks about him. Three years ago he also exhibited ideas of persecution during a severe attack of influenza when he was disoriented for a week and felt that his family were against him.

"During his stay in the hospital, a complete medical work-up was done. Nothing was found to explain the loss of weight on an organic basis. The only positive finding which could have any bearing on the symptoms was a marked atrophy of the left arm and shoulder with a considerable degree of deformity, the result of infantile paralysis in childhood. Although of no organic importance at the present time, this has undoubtedly been a source of much embarrassment to the patient and has contributed to his feeling of self-consciousness and inferiority. A psychiatric consultant felt that the patient's depression was sufficiently marked to suggest the possibility of a progression to an organic stage.

"In view of the lack of positive findings of any organic disease process, the social history and personal characteristics of the patient seem sufficient to explain his symptoms."

Then follows a discussion of the specific plans for after-care, the report on the talks that the student had with the patient's wife, his instructions to her in full detail of diet, rest and exercise. The psychiatric implications of this case are evident, but it is clearly one in which the social implications might have been missed in a busy general medical clinic. This case presents an interesting illustration of a concept significant to both sociology and social psychology, namely, the importance of *position* or *status* to the individual. It brings out clearly how important is the consideration of the person in his human relationships and how futile in such a case is the physical pathology alone.

Another student chose for his social case study a widower sixty years old, isolated from his family, with a diagnosis of rheumatic heart disease, hypertension, auricular fibrillation and cardiac decompensation. He traced in parallel columns the patient's medical and social histories, from preprohibition days of working in a brewery, through an unsuccessful period of farming, to feeding an incinerator ten and a half hours a day. This last job he had held three years, long after he felt too ill to carry it, because he earned good wages with which he was paying off a mortgage on his farm. The student reported the patient's anxiety about the possible loss of his farm because he could not pay his taxes. The social worker was able to arrange to have these taxes abated. Arrangements were made for the student to see the process of feeding the incinerator to get a clearer idea of the patient's job, and to impress upon him the importance of the doctor knowing the details of a cardiac patient's work. His suggestion that the patient might run an elevator or be a night watchman brought out the requirements for elevator licenses in the interest of protection of the public, and the responsibility often placed on night watchmen for climbing of stairs and tending furnaces.

A student's report on tuberculosis in the father of a family in which two children on examination were found to be infected, gave a vivid illustration of the expense to the community of the care of tuberculosis and the operation of the Mother's Aid Law.

Other cases reported by students have brought out in the group discussion such subjects as:

Industrial disease and workmen's compensation illustrated by a case of lead poisoning in a rubber worker.

Child labor of a patient who had begun work in a textile mill at twelve years of age.

Dependency and old-age with its complex problems, social and psychological, in a seventy year old dressmaker, whose savings had been lost in a bank failure. A discussion of the social policy back of old age insurance as against individual savings logically followed.

A discussion of institutional versus home care for chronic disease, the Harrison law governing the use of narcotics, problems of support of broken families liable to deportation if they ac-

cept public aid, while the wage earner is ill, came out of the presentation of a case of inoperable cancer in a recent Irish immigrant.

Again vocational adjustment with problems of personality, dependency and invalidism, with its conflict of physical and personality needs, bring out some of the subtler problems of medicine.

The young blind woman with arthritis led the students to consider the possible effects of idleness on personality, the uses of occupational therapy and the program of the State for education and vocational training for the blind.

Ample opportunity is given these days to see how devastating the feeling of insecurity can be and what a narrow margin of security most of us have. These social case studies presented by the students to the group of students who have seen the patients in the ward and know of their physical condition, give special vividness to the discussions that follow. The clinical teacher and medical social worker lead the discussion and bring out significant matters with special emphasis on the interrelation of the medical and the social factors.

These case studies also bring out clearly problems of a type that are familiar to the private physician. The students have an opportunity to measure social pathology against the criteria of reasonable success in life, which the social workers accept as the norm; "economic independence, good occupational adjustment, congenial family relations, normal recreational activities, general accomplishment in proportion to capacity, and a reasonable degree of satisfaction of wishes and interests".

If the student is to learn to recognize the implications of sickness, he should develop a habit of mind that readily sees the patient before he sees the disease. He must review the social and psychological aspects of each case as naturally as he reviews the various systems of the body on physical examination. To secure such a desirable attitude on the part of the student, he must be brought into association with those who give such thorough consideration to patients under their care. The plan of teaching at the Beth Israel Hospital, under the leadership of Dr. Blumgart, is carried on in a hospital in which for several years there has been established a definite program for training internes in the social aspects of medicine. This plan has recently been reported in detail*, but may be summarized here because of its significance in creating habits of thinking of the social aspects of sickness while in the process of preparation for professional service in the community. During the twenty months of their service, social data are required of the internes in the history of each patient and a social as well as a medical plan on discharge. The interne is thus prepared for his senior service, when he is held responsible for a social history on each patient as well as for diagnostic and prognostic data for report on the weekly medical social ward rounds, and the full problem of each patient is discussed. If the patient is to be considered for discharge, special attention is given to the plan for, and the instruction of, the patient and his family.

These medical social ward rounds are attended by the visiting physician, the internes, the medical social worker, and some fourth year medical students. The value of this experience to the doctor in training, both interne and student, is the establishment of a habit of methodical consideration of the social elements in illness and the association of ideas that suggests a complete clinical picture. He becomes familiar with community resources and learns how to make use of the specific information he can secure through the medical social worker, who is trained and free to obtain more accurate information about the patient's social situation.

In the field of social work, we hear and read much about the problem of bridging the gap between sociology and social case work. There is an equal problem in relating the common interests of medicine and sociology. Some sociologists are beginning to realize that their theoretical concepts gain vitality by contact with human problems. In the same way social case workers, having daily contact with intimate personal problems of people in difficulty, are trying to see their problems with more perspective, and to study and analyze the larger significances of their accumulated experience. The broad field of medicine offers a suitable meeting ground for those who are thinking in the terms of individual social pathology and those concerned with the meaning of such vital human experiences as we see in our modern hospitals. Social terminology is increasingly creeping into the medical field. The terms "Social Medicine", "Medical Sociology", and "Clinical Sociologist" are used freely, perhaps too freely, for they are without any accepted definitions. A common language is one of the first essentials of mutual understanding. Should not more careful thought be given to definitions of words which are borrowed to express our changing ideas in the medical field? I have seen recently one attempt by a sociologist* to justify the use of the term "clinical sociology". He explained its use by analyzing the characteristics of a "clinical" procedure as used in medicine;

1. The attention of the investigator is focused on a case, a person, presenting concrete problems.

*Derow, Harry A., and Cohen, Ethel: The training of interns in the social aspects of medicine. New Eng. J. Med. 209: 827 (Oct. 26) 1933.

*Wirth, Louis: Clinical sociology. Am. J. Sociol. July, 1931.

2. A coöperative enterprise which enlists the aid of a number of specialists.
3. It has an immediate therapeutic aim and the formulation of a program of adjustment.

The methods, given in detail as used in the Department of Medicine at the Harvard Medical School, are being applied in a variety of ways in other centers. The responsibility for teaching of medicine in its social aspects rests with the medical schools. It is hoped that the clinical teachers will take leadership in a critical review of the methods now in use and in promoting a sound program for a broad concept of the responsibilities of medical practice in the community.

Those involved in these experiments with social case teaching in clinical medicine realize that they are in an area that may soon be recognized as a fruitful field for sociologist and social psychologist. But the field is large and there is room for all who can serve the purpose of scientific medicine in its search for truth. Truth is not to be found only in the laboratory. There are ascertainable facts in the social situation of the patient that should be accurately known. There are the intangibles in every case that are difficult to get at in the abnormal atmosphere of a hospital ward or clinic. Imagination, that most precious of instruments, is the most useful in discerning the meaning of sickness to the patient. But there are also facts about human relationships that can be secured through skillful interview. Others must be secured by enlisting the coöperation of those with special knowledge and skill, familiar with the community and its resources. In so far as scientific medicine fails to demand accurate data in the social aspects of the case, it is unscientific.

If medicine is to accept intelligently its rôle as a profession with social responsibilities, it would be well if some of its leaders had more knowledge of the field of sociology. Familiarity with orderly and scientific methods of study of social phenomena of the community, rural and urban, of social institutions, and of the more recently developed technique for the study of groups in their social setting, is important to doctors. Much of this is more applicable at present to the field of public health and preventive medicine than it is to clinical medicine. But the technique of social case work has a contribution that readily applies to the immediate problems with which the doctor is concerned. Medicine, by virtue of its primary responsibility to the sick person, must not let itself get far away from the vital human emergencies with which the physician must deal. Also medicine is faced with serious questions of social policy that need objective thinking. The society of which the doctor is an important part is undergoing fundamental changes that will inevitably affect him and which he can help to mould.

The physician in the large hospital or clinic is trained to work in a group. As a student, he soon finds that the traditional doctor-patient relationship, sheltered and personal, is interfered with by complex scientific medicine in the highly organized modern hospital. The interdependence within the medical profession must be extended to other professions in the social field. The physician has common interests with the sociologist and economist, which will increase as time goes on.

We are on new frontiers. The student of medicine no longer has a future clearly marked out for him. These frontiers open territories that call for high types of physicians to explore. There is a need to apply to the field of general medicine the lessons learned from psychiatry about behavior and human relationships. The Public Health field is needing courageous and able leadership. The social legislation involving matters of health and disease should be established with the backing of wise and socially-minded physicians.

The leaders of medicine in the next two decades, which will undoubtedly be very important in our country's history, will come from our student group of to-day. Social case teaching, the adaptation of a method long used in legal and medical education, if integrated with the whole program of clinical teaching and interpreted in its general social significance, is one important way to prepare the student for his profession with its broadened social responsibilities.

THE NEISSERIAN MEDICAL SOCIETY OF MASSACHUSETTS

THE MANAGEMENT OF GONORRHEA*

II. The Clinical Diagnosis of Gonorrhea

THE discovery of "organisms resembling the gonococcus" is important evidence, but not always proof (especially in the female) of a gonorrheal infection. Conversely, failure to find these organisms is by no means conclusive of freedom from gonorrhea. The great frequency with which laboratory procedures fail to support clinical findings deserves serious consideration.

There are three major reasons for this failure. The first is in the laboratory itself. Culture of the gonococcus has not yet become practical as a routine procedure. The Gram stain is complicated and its differential powers are not above reproach. Serological tests are of debatable value. The research laboratory has produced almost nothing since the time of Gram and Neisser to augment this wholly inadequate laboratory armamentarium.

The second major reason for laboratory failure lies with the medical profession. There is need of microscopes in more physicians' offices, more thorough examination of innumerable smears intelligently taken, and more discriminate balancing of laboratory findings against history and clinical evidence.

Finally, the laboratory fails because of characteristics of the disease itself. The gonococcus soon becomes entrenched in the depths of the mucosa and of innumerable glands. The urethral glands, the prostate, the glands of Skene and Bartholin, the cervix and the female pelvis harbor the organisms long after hygiene or time has removed them from those surfaces which are accessible to the physician. Even the most carefully taken smears may not include the gonococcus.

Unfortunately gonorrhea is a communicable disease. It is communicable so long as the gonococcus is present, even though it may not be found in smears. Failure to suspect or recognize a gonorrheal infection leads to its spread in the community. There is not the least evidence that it is becoming any less prevalent, and as long as the laboratory remains the sole judge of whether an infection is or is not gonorrhea, gonorrhea will not be controlled. Countless "innocent" persons, especially women and children, have been and are being infected with this disease. Others will become infected so long as the medical profession will only confirm a diagnosis, the responsibility for which it smugly leaves resting on the shoulders of the laboratory. Laboratory findings may be an aid to diagnosis, but they cannot be depended upon to make it.

It is a fundamental principle of preventive medicine that, so far as communicable disease is concerned, the health of the community is more important than the personal liberty of the infected individual. Even reasonable suspicion that a person may have or may be developing a disease dangerous to the public health puts upon that person the burden of proof that he is not, or may not soon become, a menace to the community. It is fatuous to argue, as it has been argued for gonorrhea, that because a patient has selected a particular physician as medical adviser, that physician is automatically bound to respect the desires or feelings of the patient to the exclusion of the rights of others. If such reasoning were allowed to prevail generally, the whole structure of communicable disease control would collapse.

The health of the community is, to a very considerable degree, in the hands of the physician. He alone is trained to recognize disease or to apply those medical measures which will prevent it. He must be depended upon to search for communicable disease wherever he has reason to believe that it may exist. From the moment he entertains the suspicion, and until he can rule it out, he should make certain, himself, or through the proper agency, that disease will not be spread.

Most textbooks on gonorrheal infections insist that the diagnosis of gonorrhea must not be made unless "organisms which resemble the gonococcus" are found. That argument has its origin in a peculiar mixture of morals with medicine. The point of view which has fostered that argument assumes that those who have gonorrhea are all morally delinquent and that they more or less deserve their infections. It has produced a medical mind which shies away from a diagnosis of gonorrhea as it would from the direct statement that the patient has been guilty of a serious moral offense. It has been directly responsible for the deplorable neglect of this disease by a medical profession which, like the public, has been able to see only the antisocial behavior. It has led to the open ridicule of those of its ethical members who have

*This is the second of a series of articles by the Neisserian Medical Society of Massachusetts on the Management of Gonorrhea. The first, "The Laboratory in the Diagnosis of Gonorrhea", was published in the *New England Journal of Medicine*, Vol. 210, No. 7, February 15, 1934.

had the courage to specialize in the treatment of gonorrhea. It has been an effective obstacle to the control of this disease. It is the opinion of this Society that until that point of view and that argument are discarded, little progress will be made. They are incompatible with the practice of preventive medicine.

It is argued that innocent persons may be injured if the diagnosis is made on any less evidence. There is a nice question, in many cases, as to *who* may be injured if a diagnosis is *not* made. It is not immoral to have gonorrhea. If it were, then babies with gonorrheal ophthalmia neonatorum, young girls with gonorrheal vulvovaginitis, women who have been infected by their husbands, and husbands who have been infected by their wives are all immoral. A diagnosis of gonorrhea in an innocently infected person does no damage to reputation. A diagnosis of gonorrhea in a patient who has been immoral can add nothing to the damage already done to reputation, even though the diagnosis be a mistaken one.

It is the opinion of this Society that no injustice can result from a properly made clinical diagnosis of gonorrhea in the following cases, even though organisms resembling the gonococcus may not be found:

1. In a patient who used a chemical prophylaxis following exposure. Its use implies that the patient himself questioned the intercourse.
2. In a patient who was so intoxicated that neither details nor identities can be recalled, though circumstances made exposure likely.
3. In a patient who has had sexual intercourse (normal, incomplete or perverted)—
   a. With a prostitute, clandestine or commercial.
   b. With a casual acquaintance, male or female.
   c. With any promiscuous male or female.
   d. With a sweetheart, lover or fiancé who has had intercourse previously with some one else, or who is known to have been "unfaithful".
   e. With husband or wife, if he or she is known to be promiscuous or to have had gonorrhea.
   f. With any sexual partner who is known to have gonorrhea.
   g. With a homosexual.
4. In any married patient, male or female, who admits extramarital exposure.
5. In any patient, regardless of who the recent sexual partners may have been, if there is a history of a previous infection which may not have been cured.
6. In any patient, male or female, married or single, whose present condition has been diagnosed as gonorrhea by another physician, on suitable evidence.

Reputations may be damaged under only a few circumstances by an erroneous diagnosis of gonorrhea. They are as follows:

1. If the patient is married, consistently denies extramarital intercourse, gives no history or evidence of a previous infection and there is no indication that the mate has been unfaithful or has gonorrhea.
2. If the patient is single, gives no history or evidence of a previous infection and denies intercourse with anyone just prior to the onset of his infection except a fiancé, who, in turn, has never had intercourse except with the patient.

In these two cases, an erroneous diagnosis of gonorrhea might imply unfaithfulness of the patient's marital partner or fiancé. Laboratory findings, examination of the sexual partner or overwhelming clinical evidence should clear up any doubts.

It must be remembered, however, that a carefully taken history may show that a faithful wife may have been infected by a previous husband or a premarital lover.

It is not the purpose of the Society to minimize in any way the importance of laboratory evidence which may help to support a clinical diagnosis, but there is nothing in the law, nor in medical or moral ethics, which denies a physician the right to a conclusion based upon the best evidence available. Diagnosis is more often an art than a science. It is the art of arriving at a decision; of discriminating between diseases and distinguishing them by their characteristic signs and symptoms. It is unusual to find all of the signs and symptoms of a disease in a single patient. There is wide variation between the same signs and symptoms in different patients. Laboratory confirmation of a diagnosis may be had in only a relatively few conditions and not invariably in those. Nevertheless, diagnoses are being made constantly. There are innumerable cases in which the combination of history and clinical evidence makes the diagnosis of gonorrhea reasonable.

The management of gonorrhea is broader than the treatment of the patient, because it is a communicable disease. The protection of the patient's family, the sexual partner and the community is an essential part of the procedure. Warning the patient against the infection of others is not the physician's only responsibility. Those who may have been infected are entitled to the undeniable advantage of early diagnosis and prompt medical care. Furthermore, they may be as capable as the patient of spreading infection. Time is a major consideration.

A patient who has a condition which may be gonorrhea should be warned at once that it may be communicable and should be instructed as to conduct. Thereafter, for the sake of those others who may be concerned, a decision should be made as soon as possible as to the nature of the disease.

A majority of the Society believes that if the disease is clinically gonorrhea, the patient should be given the clinical opinion, even though

the patient is married and denies extramarital exposure. Otherwise it will be impossible either to control the patient or to request the examination of those who have been exposed. A minority feels that it is not necessary to express so positive an opinion. This minority would warn the patient that the condition may be communicable. A few would go so far as to say that it might be gonorrhea. This, it is reasoned, will give the physician ample control over the patient and sufficient reason for proceeding to the examination of others.

The Society is unanimous, however, in its belief that no physician is justified in allowing the probable, or even possible infection of another person when a clinical opinion might help to control gonorrhea.

A clinical diagnosis of gonorrhea may not be made lightly even though the patient admits sexual exposure. A number of other conditions may superficially resemble it. Chemical irritations, the excessive use of alcohol, balanitis, upper urinary tract infections or an intra-urethral chancre may produce some of the signs and symptoms of gonorrhea. A careless diagnosis of gonorrhea is serious if, instead, the patient has a tuberculous kidney or a urethral chancre. The patient's family or sexual contacts may be disturbed unnecessarily if the condition proves shortly to be the result of the too energetic use of a prophylactic. It must be remembered, however, that the great majority of genito-urinary infections in the male are caused by the gonococcus. Diseases of the female genito-urinary system are many and confusing, but there is ample evidence that those which *are* gonorrheal are the least likely to be diagnosed as such.

THE CLINICAL DIAGNOSIS OF GONORRHEA IN THE MALE

Gonorrhea of the male genito-urinary system always involves the anterior urethra. In all but a few cases it reaches the posterior urethra, whereupon the prostate gland and the neck of the bladder are invariably infected. The vesicles are frequently involved and epididymitis may be a complication. A gonorrheal cystitis is very rare. Gonorrheal rheumatism, ophthalmia, endocarditis, meningitis and proctitis are possible complications, the first two by no means uncommon.

The infection of the adult genito-urinary system in any other way than through sexual intercourse is an epidemiological curiosity. The term "sexual intercourse" is used in its broadest sense. Rectal gonorrhea occurs in both sexes. Homosexuality is not rare. If normal sexual intercourse cannot account for the infection, a carefully taken history will consider perversions.

Actual intercourse is not essential to infection. Any contact, however slight, which transfers pus or infectious seminal fluid from penis to vulva, or which transfers pus from vulva to penis, may result in infection. It must also be remembered that condoms break and that prophylactics used inexpertly or too late are no guarantee against infection.

The patient's true sexual history may not be obtained at the first interview. It may be necessary first to gain his confidence over a number of visits. It is important to explain to him why the truth is so essential to the proper management of the disease.

In many cases, especially those seen long after the onset of the infection, history may be of more aid to diagnosis than the clinical findings. It must begin at the beginning. The following is offered as a guide:

HISTORY IN THE DIFFERENTIAL DIAGNOSIS OF GONORRHEA IN THE MALE

1. What is the patient's chief complaint?
   (Discharge, burning, pain, frequency, urgency, tenesmus, swelling, etc.)
   What was the date (exact if possible) and nature of its onset?
   What has been its subsequent development to date?
2. What other symptoms does the patient have, or has he had, which may be related to the chief complaint?
   What were the dates and natures of their onsets?
   What has been their subsequent development to date?
3. Direct questions as to:
   (a) Urethral discharge: Date of onset, nature and subsequent history.
   (b) Urinary symptoms: Burning, pain, frequency, urgency, terminal hematuria.
   (c) Symptoms associated with defecation: Tenesmus, pain.
   (d) The nature and history of any previous complaint related to the genito-urinary system: Previous gonorrhea, "strain", prostatitis, morning drop, "gleet", stricture, epididymitis.
   (e) Any previous consultation over the present illness: Physician, clinic, druggist, friend? What was the diagnosis? Was any treatment given? (Notify the State Department of Public Health concerning any drug-store treatment.)
   (f) General medical history: Tuberculosis, syphilis, cancer, etc.
   (g) Family history of genito-urinary conditions, vulvovaginitis, ophthalmia.
   (h) The use of alcoholic beverages: Nature, frequency, quantity. Any excesses just prior to the onset of the present illness?
   (i) The use of prophylactics: Nature, frequency, dates in relation to the onset of the present illness.

(NOTE: The answers to the questions concerning alcohol and prophylactics often provide excellent leads to the direct question of sexual practices.)

   (j) Sexual habits: Frequency of intercourse. Extramarital intercourse. Dates in relation to onset of present illness and since its onset. With how many different sexual partners? (This is of great importance as the patient may believe he was infected by a certain one of several sex-

ual partners whereas examination of them all may disclose that he probably was infected by another. *He* may have *infected* a later sexual partner. Sexual partners should be considered as *contacts* and *not* sources of infection. After all, even the "source" must have been infected by someone else.)

(k) Gonorrhea or any genito-urinary condition in any sexual partner. (Patients frequently request examination because of gonorrhea in a partner or because they have been accused of infecting someone.)

(NOTE: Vulgar terminology may have to be used. It is surprising that many patients who know nothing about gonorrhea, readily understand what is meant by clap, a dose, strain, gleet, etc.)

A complete history should be taken even though the patient "admits everything" at once. A carefully taken history helps the physician, not only in differential diagnosis, but also to decide how extensively the disease has involved the genito-urinary system, how stubborn the infection has been, to what kinds of treatment it has been subjected and how it has responded, how much coöperation he can expect from the patient and how much epidemiological work may be necessary. If the patient has been on an alcoholic spree or has used chemical prophylaxis just prior to the onset of the illness or there is any suspicion of tuberculosis, cancer or syphilis, or if perversions have been practiced, the condition must be studied with these, as well as gonorrhea, in mind. It must be remembered, however, that gonorrheal infections are far more common than any of the others.

The physical examination must likewise be complete and include, eventually, the entire genito-urinary system. Otherwise differential diagnosis may be impossible. The following is offered as an outline for the examination:

GENITO-URINARY EXAMINATION IN THE DIFFERENTIAL DIAGNOSIS OF GONORRHEA

(It is assumed that a general physical appraisal, repeated blood tests for syphilis and such consultations as may be indicated are to be arranged for.)

1. The penis. General appearance, congenital abnormalities, lesions, condition of foreskin and glans.

2. The urethral meatus. Size, redness, discharge (free and with stripping). Smears of any discharge; examine for pus and bacteria.

3. The scrotum and its contents. General appearance, lesions, swelling, tenderness, condition of the testicle, epididymis, and vas deferens. Hernia.

4. Inguinal glands. Size, tenderness, bubo.

5. The anus. General appearance, discharge, inflammation, hemorrhoids, other lesions. Smears of any discharge; examine for pus and bacteria.

6. The urine. Two-glass test. Albumin, sugar, cytology.

7. Darkfield examination of any open lesion, or of the urethral discharge if there is any evidence of a urethral chancre. (This is always important even though the patient must be sent to a distant laboratory.)

8. If there is any urethritis, further examination of the genito-urinary system must be deferred, except for a most gentle palpation (not massage) of the prostate per rectum. It is important to determine the presence of a prostatitis or prostatic abscess.

Thus far it should have been possible to discover an anterior urethritis, a posterior urethritis, prostatitis, prostatic abscess, epididymitis, chancre, chancroid or other lesion, hydrocele, varicocele, hernia, and from examination of the urine, some evidence of the presence or absence of kidney conditions.

If there is no urethritis, or when treatment has caused it to subside until the second urine has been clear (except for shreds) for at least three or four weeks, or it is evident that there is no improvement, the examination may proceed:

9. Palpation of the prostate to determine size, irregularities, tenderness, consistency. If there is no contraindicating tenderness, gentle massage for the expression of prostatic secretion. The most frequently used stroke for prostatic massage is one which begins at the lateral margin and is directed toward the urethra. Massage is begun at the upper pole, alternate strokes being made on either side of the urethra. It should never be so heavy as to cause pain. Examine a fresh smear of the expressed secretion under cover glass (high power) and a stained smear (oil immersion) for pus, blood and bacteria. Repeated examination of the prostatic secretion over several weeks may be necessary if there is anything in the history or examination to suggest its infection. If no secretion can be obtained, the gland should be massaged on a full bladder at a later date and the urine examined for suspended material, then centrifuged and the sediment examined for pus.

10. The vesicles lie above and to either side of the prostate. They are rarely palpable if normal. If they are indurated, swollen or boggy, their infection must be considered. They should be stripped and the secretion examined for spermatozoa, pus and bacteria.

If there is no prostatitis, or when treatment has made further examination safe (both urines clear, except for a few shreds, an irreducible minimum of pus in the prostatic smears, and the patient is nearly ready for dismissal or there has been no improvement for many weeks), the urethra should be calibrated. Calibration serves

two purposes. If stricture has resulted from a previous gonorrhea, or from a long-standing or frequently recurrent infection, it will be discovered. (Stricture requires from three to five years or more for development.) Calibration also serves to massage the urethra, forcing pus out of the urethral glands and in some cases, lighting up what would otherwise have been a missed residue of infection.

11. Catheterize the bladder for residual urine.

12. Wash the bladder.

The art of diagnosis consists in putting together the evidence produced by history, clinical examination and laboratory procedures. These three sources of information are by no means equally or consistently productive. History may be concerned only with exposure or it may include a lengthy account of the development of the disease, depending on when the physician first sees the patient. Clinical examination may produce clear-cut evidence in the early days of an infection, or only another link in a long chain if the disease has subsided everywhere but in a single structure, such as the prostate. Laboratory findings are of less differential value as time goes on. The following is an attempt to put the picture together. The physician first sees different patients at different stages of the disease. History, clinical findings and laboratory data are considered for each of the several major stages of the disease.

THE DIAGNOSIS

I. If the patient is first seen immediately following infection.

History: Exposure, usually within a week or ten days of the onset.
Symptoms (subjective and objective): Itching or burning of meatus, especially during urination; swelling; inflammation of meatus or glans; urethral discharge; chordee is a possibility.
Signs on examination:—Inflammation of the meatus; swelling of glans; urethral discharge; chordee.
Laboratory findings: Past—Those of any previous medical consultant. Present—Pus in smear. First urine hazy or cloudy*. Second urine clear. (Organisms resembling the gonococcus should be found in this stage if repeated smears, properly taken and properly stained are thoroughly examined.)
Complications:—Gonorrheal ophthalmia; rarely arthritis or other metastatic complications.

This is an anterior urethritis. If the organisms cannot be found after repeated search, chemical irritation, meatal or urethral chancre and occasionally colon bacillus infections following perversions must be considered. The symptoms and signs may be so mild as to be almost unnoticed, or they may be extremely severe. If the infection has been treated, they may be greatly modified.

*Rule out phosphates with a few drops of dilute acetic acid.

II. If the patient is first seen when the infection has extended into the posterior urethra. This may occur almost at once, or it may be delayed a week or more.

History: Exposure. Symptoms as described under I. Previous medical opinion and care.
Present Symptoms (subjective and objective): Itching, burning, pain, frequency, urgency, and terminal hematuria. Tenesmus, backache (due to prostatitis). May be general malaise.
Signs on examination: Urethral discharge; tender, swollen prostate; terminal hematuria. Patient looks ill. Fever.
Laboratory findings: Past—Those of any previous medical consultant. Present—Pus (and blood) in urethral smear. First urine cloudy. If the posterior extension is recent, mild or subsiding, there may be insufficient pus to back into the bladder, in which case the second urine may be clear*. Otherwise both urines will be cloudy. Pus (and blood) in urine. (In an active, *untreated* infection, organisms resembling the gonococcus should be found eventually if a sufficient number of smears are examined properly.)
Complications: Prostatic abscess, vesiculitis, epididymitis, para-urethral abscess, gonorrheal rheumatism, endocarditis, meningitis or ophthalmia.

This is an anterior-posterior urethritis. It is always accompanied by prostatitis. The signs and symptoms may range from extreme mildness to extreme severity. They may have been greatly modified by previous treatment.

III. If the patient is first seen when the anterior-posterior urethral infection has subsided. This may be many days or several weeks or even months after the onset of the infection, depending upon previous treatment, neglect of treatment, poor resistance, poor conduct or a stubborn infection.

History: Exposure. Subsequent sexual history. Symptoms as described under I and II. Previous medical opinion and treatment.
Present Symptoms (subjective and objective): Morning drop or intermittent or recurrent exacerbations of urethral discharge, which may be related to the use of alcohol or to sexual excitement. Forked stream. Backache.
Signs on examination: There may or may not be a urethral discharge at the time of examination, or it may be expressed by stripping the urethra. The prostate may or may not be tender, boggy or swollen. The vesicles may or may not be palpable.
Laboratory findings: Past—Those of any previous medical consultant. Present—May be few or no pus cells in smear from urethra. (If there is only a morning drop or occasional discharge, give the patient some slides with instructions to make smears.) First urine clear or hazy, depending upon the amount of urethral discharge, but contains shreds in either case. Second urine clear. Prostatic smear contains pus cells, often in great numbers. If no prostatic secretion can be obtained, massage the prostate on a full bladder, centrifuge the urine and examine for pus and blood. Organisms resembling the gonococcus will rarely be found. Complement fixation test may be positive.

*In that case, irrigate the anterior urethra before the patient voids. Any pus in the urine will then have come from the posterior urethra or higher urinary structures.

Complications: Prostatic abscess, vesiculitis, epididymitis, para-urethral abscess or sinus, cowperitis, rheumatism.

This is the picture of a prostatitis persisting after the urethral infection has subsided. It is seen almost invariably in the patient who has become discouraged with the results of drug-store or self-treatment, or who is a "medical shopper". *It is the most difficult stage of the disease in which to make a diagnosis, and it is the most dangerous because the patient is sufficiently comfortable to resume his sexual activities and spread his infection. The control of gonorrhea, so far as medical measures are concerned, depends to a very great extent upon the recognition and control of the disease in this stage.* Diagnosis depends a great deal upon accurate and detailed history as to exposure, development of the disease and any previous medical opinion and treatment.

IV. Miscellaneous Considerations.

1. If there is a persistent urethral discharge, no evidence of chancre or upper urinary tract disease, history, symptoms and signs point to gonorrhea, and the prostate does not appear to be the seat of the residual infection, search should be made for "pockets" of infection in the urethral glands. Cowperitis may be the cause of a resistant infection. Massage the urethra on a sound.

2. An epididymitis not associated with a history or clinical picture of gonorrhea, or which persists beyond reasonable limits, calls for careful consideration of tuberculosis, neoplasm, etc. It is important to examine the scrotal contents intelligently. Conditions involving the testicle, such as a gumma or neoplasm or orchitis from whatever cause, must be distinguished from those involving the epididymis. Hydrocele is to be distinguished from spermatocele, hernia and varicocele. Familiarity with the anatomy and pathology of the scrotal contents is essential.

3. A urinary picture incompatible with gonorrhea or which does not follow the course of the disease calls for an investigation of the upper urinary structures; bladder and kidneys.

4. A prostatic condition not associated with a history or a clinical picture of gonorrhea, or associated with residual urine or retention of urine, calls for investigation for hypertrophy or neoplasm. Urinary retention requires calibration of the urethra for possible stricture.

5. *Syphilis must always be considered.* The incubation period of syphilis may be several days or several weeks. The primary lesion may be missed. Routine physical examination and serological study should be made up to at least twelve weeks after exposure. Even then the patient should be warned to report any subsequent sore, rash, persistent headache or other symptom characteristic of syphilis.

6. Consultation, in case of doubt, is both advisable and available.

NOTE: The Clinical Diagnosis of Gonorrhea in the Female will be discussed in the Society's next paper.

DAUGHTER WILL USE MME. CURIE'S RADIUM

The gram of radium received by the late Mme. Marie Curie as a gift of the women of America was deeded last March 25 to the University of Paris, according to word received here yesterday by Mrs. William Brown Meloney, founder and chairman of the Marie Curie Radium Fund.

Under the terms of the deed, Mrs. Meloney said, Mme. Joliot Curie, the famous scientist's daughter, who is herself a noted physicist, is to be allowed unrestricted use of the element for experimentation and research in the field first discovered by her parents. The deed is believed to have served as Mme. Curie's will and disposes of all of the property of any considerable monetary value she possessed at the time of her death.

The document left by Mme. Curie, a copy of which was received by Mrs. Meloney, read in part as follows:

"The value of this element being too great to transfer to a personal heritage, I desire to will the gram of radium to the University of Paris on the condition that my daughter, Irene Curie (now Mme. Joliot Curie, the wife of M. Frederic Joliot, a distinguished man of science, who subsequent to their marriage consented to take the family name of his wife), shall have during her life entire liberty to use this gram of radium, whether at Paris or in the provinces, according to the conditions under which her scientific researches shall be pursued.—*New York Times*, July 21, 1934.

A STUDY OF THE MORTALITY OF APPENDICITIS

The Salt Lake County Medical Society and the Salt Lake City Board of Health are concentrating on a campaign to reduce the mortality from appendicitis in Salt Lake City. Warnings are being given to the public against the taking of laxatives for abdominal pain; and the public is being urged to give prompt medical attention to such pain. Questionnaires are being sent to physicians and it is hoped that their answers will lead to the evaluation of the factors that make for success or failure in the treatment of appendicitis.—*Bulletin, Metropolitan Life Insurance Company.*

CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 20311

PRESENTATION OF CASE

A fifty-eight year old German laborer entered complaining of back pain of nine weeks' duration.

Two years before entry he had a sudden severe epigastric pain which radiated to the right back. This pain was not colicky and lasted one week. He had nausea and anorexia but no vomiting. A few days later his skin became yellow, his urine dark, and the stools white. All these changes disappeared within the week. Milder attacks of pain continued to recur almost daily for the next three months. These attacks lasted about an hour. He had no further jaundice. Fried foods produced distress, anorexia and constipation. His weight dropped from 220 to 150 pounds and then with improvement in his condition gradually rose to 196. Nine weeks before admission he developed attacks of sharp non-colicky pains in the epigastrium and right upper quadrant. These pains radiated to both sides and were not related to meals. He had anorexia and some sour eructations, but no vomiting. There was no jaundice or dark urine. His stools were yellow. He went on a milk diet three weeks before entry. He had lost forty pounds during the past two months. Four weeks before entry he developed a dry cough associated with small amounts of slimy sputum.

His family and past histories are irrelevant.

Examination showed a large, well-developed and nourished man in no acute distress. There was an icteric tint to the sclerae. The pharynx was moderately injected. Examination of the chest showed limited expansion with some dullness at the bases, more marked on the right and with some suppression of breath sounds. There was a short systolic murmur at the apex. The heart was only slightly enlarged. The sounds were distant. The blood pressure was 104/70. The liver edge was felt two finger-breadths below the costal margin.

The temperature was 101°, the pulse 90, the respiration 26.

Examination of the urine was negative. The blood showed a red cell count of 4,000,000 with a hemoglobin of 60 per cent. The white cell count was 18,000, with 70 per cent polymorphonuclears. A liver function test showed 15 per cent retention. The non-protein nitrogen was 33 milligrams.

X-ray of the chest showed a somewhat less radiant left lung field. The diaphragm on the right was somewhat high. The heart shadow was prominent to the left, in the region of the ventricle.

Four days after admission, operation was performed. Two days after operation very early in the morning the patient complained of pain in the midchest and appeared very dyspneic. He said that he had had these symptoms for an hour. Half an hour after the house officer was summoned the patient was observed to be much worse. He became pale, more dyspneic, his pulse became weaker and his hands and feet cold. Two hours later he suddenly became much worse and preparations for a second operation were made. He died on the operating table.

X-RAY INTERPRETATION

DR. GEORGE W. HOLMES: We have a single film of the chest and a Graham test of the gall bladder.

The gall bladder was not visible in the films taken after giving the dye. I think the Graham test should be interpreted as positive.

The film of the chest was taken with the patient lying on his back. That would tend to bring the diaphragm higher than we usually see it, and also tend to magnify the heart shadow considerably. In spite of this, I think there is a little enlargement of the heart shadow to the left, true left-sided enlargement. There is nothing in the lungs that I should want to interpret as abnormal. The density here is probably due to the position, with elevation of the diaphragm on that side.

FURTHER HISTORY

The first operation was cholecystectomy and drainage of the common bile duct. The second operation planned for was removal of a pulmonary embolus.

DIFFERENTIAL DIAGNOSIS

DR. TRACY B. MALLORY: I have asked Dr. Sprague to make a differential diagnosis on this case. He has never seen the patient.

DR. HOWARD B. SPRAGUE: I received a little more information from this discussion than was handed me in the abstract case. But I am not sure how much that helps me.

The story we get first seems to be consistent with that of cholecystitis and cholelithiasis. The patient enters, however, with an exacerbation of the symptoms and possibly the development of some others. The chief symptom was pain in the back. I think we can believe the diagnosis of gall stones very likely because of the presence

of jaundice in the past and the character of the stools and the urine.

He was operated on, we are told, for gall bladder disease. Then this acute episode occurs two days later and a second operation, I am told in the abstract, was prepared for with the idea of removing a pulmonary embolus. In the first place we are confronted with this differential diagnosis of pulmonary embolus or something else in the acute stage. There is certain definite information we ought to have if we are going to justify an operation of such gravity. In the first place we want evidence of dilatation of the veins of the neck. It does not seem to me justifiable to advise operation for removal of an embolus of the pulmonary artery unless it is obstructing a large enough vessel to produce distention of the veins of the neck. Then we should like to know whether there is a gallop rhythm in the heart along the border of the sternum indicating sudden strain on the right ventricle. We should also like to know if there is any evidence of increased tension in the pulmonary artery or dilatation causing a friction sound over the second left interspace, and we should like to have the advantage of an electrocardiogram. These things seem to be entirely absent in the examination given here, except that we have the statement that the neck veins were not distended.

If the differential comes up in relation to cardiac disease, chiefly coronary thrombosis or something else in the cardiovascular system, we ordinarily see if we can find any evidence of previous cardiac disease. There is no diagnostic story of previous cardiac difficulty. The story is not a good one for angina pectoris. There is a note that he had developed some cough late in the course of his illness. We find some enlargement of the left ventricle, a systolic murmur at the apex. The man weighed at one time two hundred and twenty pounds and weighed, I think, one hundred and ninety-six pounds when he came in. It is difficult, particularly in the presence of a high diaphragm, to be sure of enlargement of the left ventricle, but if we assume there is some enlargement of the left ventricle from previous hypertension we are confronted with an admission blood pressure of 104/70. I think that is perhaps the most suggestive evidence that there was some cardiac disease present.

The pain in the back extending from the shoulders down to the buttocks is difficult to explain from the standpoint of gall bladder disease and it perhaps makes one a little suspicious of the aorta as regards dissecting aneurysm. But there is no note about the character of the aorta by x-ray.

The patient dies and there is before death a paradoxical pulse and more drop in blood pressure. Of course the pulse suggests some difficulty in the pericardium. The patient might possibly have had a cryptic coronary occlusion previously and there might have been a rupture of the heart, of a coronary, or a rupture at the base of the aorta into the pericardium.

I cannot be sure about the diagnosis in this case. I should say of course that, statistically, following an operation the diagnosis would be pulmonary embolism, but from the description of the case I am pretty skeptical about it.

DR. MALLORY: Dr. Welch, can you tell us any more about the first operation?

DR. C. E. WELCH: I will read the operative note.

"Examination of the liver showed marked hepatitis extending towards the diaphragm from just above the gall bladder. There was edema between the liver and the diaphragm, and it suggested the possibility of a later subdiaphragmatic abscess. The gall bladder was found practically buried in the liver. The cystic duct was identified, the cystic artery clamped, the gall bladder removed with considerable difficulty, having to be dissected free from deep in the liver substance. A further exploration of the stump of the cystic duct showed a stone impacted in it, the gall bladder itself having contained no bile. The common duct was opened. A probe passed easily into the duodenum, and no stones were felt. The bile itself contained numerous flecks of what looked like pus. The pancreas was markedly thickened and porky, involving the head only. A T tube was placed in the common duct for drainage. Cigarette wick to the bed of the gall bladder. Wound closed in layers."

DR. MALLORY: Dr. White, can you tell us any more about the physical signs immediately preceding death?

DR. JAMES C. WHITE: I had a chance to see this man for about an hour before he died. He was perfectly conscious. He presented the typical picture of what we think of as surgical shock,—cold extremities, sweating, thirst, apprehension, rapid pulse and falling blood pressure. I examined him very carefully for distention of the veins in the neck because I was thinking of pulmonary embolism, and I think I have it down in my record that I could not see them at that time. Dr. Welch says he was unable to see them too.

DR. MALLORY: Does the additional information help you at all, Dr. Sprague?

DR. SPRAGUE: It only makes me feel more strongly that it was not pulmonary embolism.

DR. WHITE: I was very skeptical about this patient. Two days is very early for pulmonary embolism after operation. Also he had too much pain. He was complaining of pain when I watched him. Most of the patients with pulmonary embolism have had very little pain.

Here was a man complaining of severe pain in the chest and through to his back. This was most unusual. It was so early in the morning that we could not get an electrocardiogram. As a matter of fact you cannot use one in the surgical amphitheater anyway, so we were unable to help ourselves in that way. I cannot remember whether Dr. McGinn or any of the Cardiac Clinic group saw this patient.

As far as the distention of the neck veins goes, I was down here about two months ago to discuss another case, and I finally concluded that the patient must have died of some cause other than pulmonary embolism, because there was no evidence that the veins in the neck were engorged. Dr. Mallory told us that the patient died of a typical pulmonary embolism. The next case on that day Dr. Breed discussed, I believe, and that patient also had no distended neck veins, but died of pulmonary embolism. At a recent medical meeting a well-known surgeon made the statement that the operation for pulmonary embolism was simple, and that one ought to do an early exploration of the pulmonary artery in doubtful cases. I objected to that statement at the time, and I would not have considered operating when I first saw this patient. I talked to his wife and told her that I was in doubt about the diagnosis, but if he was obviously dying I would go in at the last moment and see if there was a clot. If this were the case, it might give him a chance of recovery, whereas if no embolus were found, it would at least do no harm. That is what we did. Actually it was an early postmortem examination. His heart had stopped beating when the incision was completed. We opened the pericardium very quickly and found that it contained pus.

Clinical Diagnoses

Cholecystitis and cholelithiasis.
Cholangitis.
Suppurative pericarditis.

Anatomic Diagnoses

Operative wound: cholecystectomy with drainage; drainage of pericardium; embolectomy.
Acute fibrinous peritonitis, localized.
Cholangitis.
Hepatic abscess.
Subdiaphragmatic abscess, perforating the diaphragm into the pericardium.
Pyopericarditis.
Pulmonary embolus, small.
Pulmonary collapse, left.
Pneumothorax, left.
Pancreatitis, chronic.
Arteriosclerosis, slight coronary, aortic and renal.
Cardiac hypertrophy, slight.

Pathologic Discussion

Dr. Mallory: The one lead to the diagnosis in this case was the surgeon's note of the rather extensive hepatitis and the possibility of a subphrenic abscess. The patient had, as a matter of fact, an acute cholangitis extending throughout most of the liver, with a relatively large subphrenic abscess that perforated into the pericardium through a hole half a centimeter in diameter in the diaphragm, and he developed acute pericarditis from that. Just how long he had it I am uncertain. I am quite sure he had had it longer than the hour which his dramatic terminal symptoms lasted. Probably it had been present twenty-four hours or more. Why there should have been such a sudden shift in the clinical picture I am entirely uncertain. I suppose the gradual accumulation of pericardial fluid suddenly reached the limit at which tamponade began. When tamponade occurred he suddenly went into failure and shock.

He did as a matter of fact have a pulmonary embolus, but it was such a small one that I feel it was of no clinical significance.

Dr. White: It is difficult to understand why he did not have visible neck veins too with that diagnosis.

Dr. Mallory: Yes, I think it is.

Dr. Sprague: Was the heart normal?

Dr. Mallory: It was enlarged. It weighed 450 grams. He had a certain amount of coronary sclerosis, but no sufficient narrowing at that point to be of any significance.

Dr. Sprague: Do you still think, Dr. White, that the patient should have distended neck veins before you operate?

Dr. White: No. It is a great comfort to the surgeon if he has, but I do not see how we can insist upon it.

CASE 20312

Presentation of Case

First admission. A two year old American-born girl of Greek parentage was admitted for the first of her six admissions five years and a half before her final admission, with a complaint of pallor and weakness since she was three months old.

Family history. The parents and three older siblings were alive and well. There was no family history of tuberculosis, syphilis, or blood disease.

Past history. The birth was normal at term. The child was not cyanotic or jaundiced. She seemed perfectly well until she was three months of age, at which time she weighed 10 pounds. She was exclusively breast fed until she was nine months of age; then she was given milk, vegetables, cod liver oil, and orange juice. She

had always been constipated, and at the time of admission she was having no movements without cathartics. The stools were described as greenish and watery. She held her head up well at three months. At two years she was not walking and said only single words. She was a very good child. She had whooping cough at one year of age.

Present illness. At about the age of three months the baby was first noted to have developed a yellowish pallor. She frequently had projectile vomiting. Her appetite was always good. She was listless and played only a little. She never moved around much, but sat or lay down. For the past two months she had been more irritable. Three weeks before admission she was said to have had "tumors" in the neck. At this time she had running ears and some fever.

Physical examination showed a poorly developed and nourished girl. She was pale and asthenic and had a subicteric pallor. There was slight edema of the face, wasting of the limbs, and a "pot belly". She moved around slowly, but did not seem toxic or acutely ill. The lymph glands were generally enlarged, but small and hard, not tender or fluctuant. Both ears were discharging pus. The mucous membranes were very pale. The tonsils were large and ragged. The chest was negative except for a soft systolic murmur heard over the precordium. There was a protruding abdomen, most noticeably so in the left upper quadrant. The surface veins of the lower abdominal wall were dilated. The spleen was large, hard, nodular, and extended down to press upon the iliac crest. The liver extended from the fourth rib to the umbilicus. The abdomen was thought to contain fluid. The reflexes were normal. The child could stand only with help.

Laboratory studies. The urine was negative except for the slightest possible traces of albumin and urobilin. Tuberculin and Hinton tests were negative. The bleeding time, clotting time, icteric index, and van den Bergh were normal. The platelets were diminished in number. Examination of the blood showed a red cell count of 1,650,000 with a Sahli hemoglobin of 40 per cent; a white cell count of 48,000, 39 per cent polymorphonuclears, lymphocytes 52 per cent, large mononuclears 6 per cent, myelocytes 3 per cent. The smear showed marked achromia, poikilocytosis and anisocytosis, with 11 per cent normoblasts. Reticulocyte counts showed about 7 per cent reticulocytes. The stools were negative.

On the fifth day a biopsy of a neck gland was done and a transfusion of 200 cubic centimeters was given. The biopsy showed lymphoid hyperplasia. A second transfusion of 300 centimeters was given about five weeks later. She was also given 45 grains of saccharated iron daily. No permanent improvement was noted.

The consultants agreed that the condition was probably a von Jaksch's anemia. A splenectomy was done because the enlarged spleen was causing mechanical pressure and discomfort. After the splenectomy the nucleated red cells increased from 7 per cent to 82 per cent. She made an excellent postoperative recovery.

Second admission, six months later, was for follow-up studies. She had gained in weight; her appetite was good; her bowels were regular; she could walk around; and she used short sentences. Her skin still had a yellowish tinge. The liver was 4 centimeters below the costal margin.

Third admission, two and a half years later, was for a pathological spiral fracture of the left femur.

Fourth admission, a year later, was for study. She was growing and her appetite and disposition were good.

Fifth admission, four months later, was for extraction of diseased teeth. There was very little change in her condition.

Last admission, a year later, was for a cold and fever. In the previous year she had been well except for a draining middle ear infection which lasted two months, and poison ivy dermatitis. Six days before admission she developed a cold, with nasal discharge and a dry unproductive cough. She had had chills, fever, and sweating the night before admission.

Examination showed dullness and bronchial breathing in the lower half of the right lung. The heart was enlarged. The red cell count was 1,200,000, with a hemoglobin of 25 per cent. The white cell count was 25,000 (corrected), with 70 per cent polymorphonuclears.

She held her own for two days, then showed signs of marked respiratory embarrassment and was put in an oxygen tent. She died on the seventh day.

In the five years during which she was under observation her weight increased from 16 pounds to 36 pounds. She was about 15 pounds under weight at the onset of her last illness. She was of fairly normal height, but appeared definitely pale and sallow. She was never an active child, following a more or less sedentary existence. She never went to school. Her chest gave the appearance of rachitic deformity. Her abdomen was normal in size.

The following table gives the data in regard to her blood picture. It will be noted that following splenectomy the number of nucleated red cells increased markedly; also the reticulated cells were unchanged. The white cells varied in number, but the differential count showed no particular variation from the first one made. The nucleated red cells are not included in the white blood counts.

BLOOD

Date	Red cells	Per cent total nucleated red cells	Reticulocytes	Hemoglobin (Sahli)	White cells
First admission					
5-19	1,650,000	5	6.7	25	48,000
5-25	(Transfusion)				
5-27	3,250,000	9	4.3	42	25,050
5-31	1,670,000	4	2.6	37	12,150
7- 3	(Transfusion)				
7- 6	2,960,000	7	3.3	45	16,350
7-16	(Splenectomy)				
7-21	3,000,000	19	3.5	42	28,800
7-26	2,780,000	82	3.6	45	15,850
Second admission					
11-5	1,860,000	75	3.2	35	26,650
Outpatient Department					
10-8 two years later	1,850,000	56		35	50,150
Fourth admission					
7-18, a year and nine months later	1,800,000	65	1.9	40	60,300
Fifth admission					
1-2 six months later	1,860,000	78		45	48,000
Sixth admission					
11-23, ten and a half months later	1,860,000	67		25	25,950

Clinical Discussion

Dr. Harold L. Higgins: Our diagnosis in this case was Cooley's anemia, sometimes known as erythroblastic anemia. The child died of a pneumonia, probably lobar pneumonia.

The case is very characteristic of the so-called Cooley's anemia. It appears in patients of Mediterranean races, usually is first discovered when the child is about a year old, and death is usually the result of intercurrent infection. The apathy, the listlessness, and the porosity of the bones are quite characteristic. Most of her lack of activity is probably due to anemia. The disease as we see it is characterized by involvement of the bones, which may be seen by x-rays. The bone marrow seems to show unusual activity; in the hyperplasia of the bone marrow there is erosion of the cortex of the bone. Marked osteoporosis and striking vertical striations are present, also peculiar spicules in the wormian bones of the head seem to stand out.

Splenectomy does not cure the disease. It was done in this case for mechanical relief. The child could not stand because the spleen was so big and heavy. The result of splenectomy on her blood count is quite striking. The nucleated red cells increased in number immediately. The increase lasted throughout the life of the child.

Erythroblastic anemia was described about 1925 by Cooley of Detroit. Previous to that time it had been one of a number of rather ill-defined blood diseases which went under the name of pseudoleukemia or Von Jaksch's anemia.

Dr. Tracy B. Mallory: These full blown cases of Cooley's anemia present a most striking picture, particularly in the x-rays of the skull. I do not think the ones in this case are very characteristic as compared with some I have seen. This widening of the bones is apt to be most marked in the skull, but it always involves practically all the bones, and the point of maximum involvement may vary from case to case.

Clinical Diagnoses

Lobar pneumonia.
Erythroblastic anemia.

Anatomic Diagnoses

Erythroblastic anemia.
Lobar pneumonia.
Hydropericardium.
Parathyroid cyst.
Operative scar, splenectomy.

Pathologic Discussion

Dr. Mallory: Histologically I think the findings are not so striking as one would expect from the x-ray picture. There is a very marked hyperplasia with a relative lack of differentiation on the part of the red cells, that is a greatly increased proportion of immature cells. White cell formation goes on practically undisturbed. The white cells are not crowded out to the extent that they often are in pernicious anemia, for instance, or in erythroblastosis of the newborn. Instead, marrow tissue invades the cortex, passes through it to the subperiosteal layer, and fresh cortical bone is laid down beyond it.

In this child the skull was not at all striking except in one or two places. You can see one focal area where the skull is over a centimeter thick. In many cases the entire skull would be uniformly as thick as that. The marrow is also markedly increased in the long bones, that is,

they are filled with active marrow with total absence of fat cells.

The most striking feature of this case was in the ribs. The upper eight ribs for the first five centimeters on each side of the vertebral column were thickened to three times the normal size and then rather suddenly tapered back to normal again.

Have you anything to add, Dr. Eustis?

DR. RICHARD S. EUSTIS: I have very little to say about a case of this sort. I think the history shows a few points. There is usually in the so-called von Jaksch's anemia a history of poor nutrition and infection. This child shows both. She weighed only ten pounds at three months. She was breast fed with supplementary feedings until she was nine months old, which undoubtedly gave her a rather poor start nutritionally. On top of that she had an early upper respiratory infection, which we know in infants often has an effect upon the blood forming organs. It is however rather uncommon to get severe secondary anemias in infants from such a cause. Why in the Mediterranean races, in this country at least, a certain number of cases of anemia should progress to this fatal type I have no idea, unless it has something to do with the change of diet; after they get over here they miss something they had on the other side.

I think the history also illustrates the uselessness of most of our attempts at treatment. Any improvement following transfusion was only temporary. She was certainly mechanically better following a splenectomy, but it did not alter the course of the disease.

Do you know, Dr. Mallory, if such cases are reported in Europe?

DR. MALLORY: I have been told that they have not been. Do you know, Dr. Kimmelstiel?

DR. PAUL KIMMELSTIEL: So far as I know they have not been recognized as such.

DR. MALLORY: The familial character deserves emphasis. A number of children in the same family very frequently are affected.

DR. HIGGINS: Von Jaksch was from Prague; but his published cases do not fit in with Cooley's anemia as we see it.

DR. MALLORY: I confess to being very vague about von Jaksch's anemia. This disease that Cooley described is certainly a very clearly defined pathologic entity about which there can be no question at all.

DR. EUSTIS: Von Jaksch's anemia is just a grab-bag diagnosis for severe anemia in infancy with enlarged spleen. It may be secondary in type or may develop into one of the more severe primary conditions. I do not think it is a condition. It is a syndrome.

DR. MALLORY: The most characteristic feature of this case, and I think it is true of all examples of the disease, is the location of the freshly formed hematopoietic tissue. Usually when we find very marked marrow hyperplasia, whether of the white cell or red cell series, and the marrow cavities of the bones are insufficient to take care of it, we observe a reversion to the fetal type of blood formation in the liver, in the spleen and sometimes in the kidneys. In this case the liver is totally free from it. The hyperplasia is so marked that it has destroyed the bones, but there is no hematopoiesis in the liver whatever.

A SURGEON: Did Dr. Castleman find the parathyroids in this case?

DR. MALLORY: Yes; three were negative and the fourth had a small cyst. The other endocrines were all normal.

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THE VITAMIN D COMPLEX

THE spirit of vitamin D still goes marching on. It is a hardy spirit, a cheerful spirit, an inspired spirit, and its indispensability has been so impressed upon the minds of doctor and layman alike that it appears upon the most absurd occasions and in the most unlikely places imaginable.

There is an increasing awareness in the most scientific as well as in more social circles of the uses of the so-called vitamins. Those who read as well as those who merely run must be continually impressed with the new knowledge that is being added as a constant increment to our old knowledge; especially that which indicates more sensitive and less perceptible results of vitamin deficiencies than the forthright and well-known deficiency diseases. Those who think upon these problems after having read or run or both must also be impressed with the probability that a satisfactorily balanced ration contains all of the vitamins in sufficient amount, with the possible exception of vitamin D.

It is this possible exception that has made vitamin D so vulnerable to commercial exploitation—that and the discovery that ultraviolet radiation was so similar in its effects to vitamin D ingestion as to make the two practically interchangeable if not, indeed, identical. The result has been a barrage of commercially irradiated foods and other objects that has resulted, unfortunately, if in nothing else, in a distrust of the whole business; for irradiation has its merits and its uses.

Perhaps the high tide of this irradiation fever —we hope it will go no higher—has been the irradiation of toilet tissue. Cereal foods have been irradiated, oils of various sorts have been irradiated, and now even the lactic product of the placidly ruminating domestic bovine has been irradiated, in both its bottled and its canned forms. We would not decry the use of irradiation except in its more absurd manifestations, although certainly if all the objects irradiated stayed put in their degree of irradiation there might be danger of serious results, but the facts should be enquired into before too much faith is placed upon their efficacy.

There is as yet no evidence, for example, that irradiated milk has solved once and for all the question pertaining either to the most perfect milk or to the most effective source of vitamin D. The irradiation of milk gives no guarantee as to its excellence as milk; overirradiation causes certain types of decomposition in the milk itself; the maximum irradiation results in barely more than a third of the vitamin D units contained in vitamin D milk secured from yeast-fed cows, and there is certainly some destruction of the equally necessary vitamin A by the process of irradiation.

The controversy, if such there exists, may be summed up at present as follows: Milk of any quality may be irradiated, and the virtue of the irradiation itself is as yet not certain; it may have harmful effects upon the milk as well as beneficial ones. Vitamin D milk from yeast-fed cows is beyond question an effective carrier of sufficient vitamin D units to cure rickets in the shortest possible time; it is, moreover, in this State at least, restricted to certified milk and certified milk remains the safest and cleanest milk that is generally produced.

TUBERCULOSIS AS IT AFFECTS THE PHYSICIAN'S PRACTICE

THE above quoted title of Dr. Chadwick's paper which was read before the Section of Medicine at the last Annual Meeting of the Massachusetts Medical Society appears on page 204 of this week's *Journal.*

In this paper there is a review of the tuberculosis situation in Massachusetts which carries a definite challenge to the practicing physicians of this state regardless of whether they are family advisers or specialists in any field. The author shows that tuberculosis is no respecter

of the person or his age, and, although it has been deposed as the leading cause of death, and there is no mystery in its pathology, it is of vast importance as an enemy of the human race.

Like cancer it kills slowly, and even though its ravages begin at earlier ages than do those of malignant neoplasms, the fifth, sixth and seventh decades find tuberculosis taking a prominent place in mortality statistics.

Soon after the discovery of the cause of tuberculosis there was hope that science could deal with this disease as effectively as it has with diphtheria. But, although research has thus far failed of finding any specific therapeutic agent, careful and persistent studies of all the factors involved have shown that much may be expected in the reduction of the incidence of the disease and also in curing it.

This means early diagnosis, well carried out sanatorium treatment and the contributory services of expert surgeons.

Under the direction of public health authorities the laity has joined forces with medicine, and with this combination of science, financial support and combined effort there is assurance of still further progress.

Dr. Chadwick, however, shows that the first line of attack is weak, in that there are probably ten thousand undiagnosed cases of tuberculosis in Massachusetts, and with this as with many other diseases early recognition is requisite if the gain now underway is to be augmented. It has been claimed that the teaching of all phases of tuberculosis is inadequate, not only as a disease entity but also in its sociologic implications; for the control rests with the patient and his friends to a large extent in dealing with the dangers of contact.

The author suspects that there are, on the average, two undiagnosed cases of tuberculosis for each of the registered doctors in the state. Whether this is due to carelessness on the doctor's part, his inability to recognize this disease, or possible inattention to early symptoms on the part of the patient, the facts call loudly for reform which should be the concern of the State Medical Society.

Dr. Chadwick has spoken in no uncertain tone. The question is, will organized medicine act in assisting the Commissioner of Public Health to ascertain where the blame rests and how to lead the profession to take its proper place in dealing with tuberculosis?

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

MYERSON, ABRAHAM. M.D. Tufts College Medical School 1908. Professor of Neurology, Tufts College Medical School. Director of Research, Boston State Hospital. Senior Visiting Physician, Boston City and Beth Israel Hospitals. His subject is "The Social Conditioning of the Visceral Activities." Page 189. Address: 270 Commonwealth Avenue, Boston, Massachusetts.

JACKSON, HENRY, JR. A.B., M.D. Harvard University Medical School 1919. Assistant Professor of Medicine, Harvard University Medical School. Associate, Thorndike Memorial Laboratory. Junior Visiting Physician, Boston City Hospital. Physician, Pondville Hospital. Associate Physician, Collis P. Huntington Memorial Hospital. His subject is "Cancer and the General Practitioner." Page 193. Address: Thorndike Memorial Laboratory, Boston City Hospital, Boston, Massachusetts.

SWIFT, HOMER F. B.Ph., D.Sc., M.D. New York University and Bellevue Hospital Medical School 1906. Formerly: Instructor in Pathology and Dermatology, New York University. Assistant, Rockefeller Hospital. Resident Physician, Rockefeller Hospital. Associate Professor of Medicine, College of Physicians and Surgeons, Columbia University. Now: Member Rockefeller Institute. His subject is "The Chronicity of Rheumatic Fever." Page 197. Address: Rockefeller Institute for Medical Research, 66th Street and York Avenue, New York City.

CHADWICK, HENRY D. M.D. Harvard University Medical School 1895. Formerly: Superintendent, Vermont Sanatorium. Superintendent, Westfield State Sanatorium. Tuberculosis Controller, Detroit, Michigan. Now: Massachusetts State Commissioner of Public Health. His subject is "Tuberculosis as it Affects the Physician's Practice." Page 204. Address: 1063 Commonwealth Avenue, Newtonville, Massachusetts.

MIXTER, WILLIAM JASON. S.B., M.D. Harvard University Medical School 1906. F.A.C.S. Assistant in Surgery, Courses for Graduates, Harvard University Medical School. Visiting Surgeon, Massachusetts General Hospital. Address: 319 Longwood Avenue, Boston, Massachusetts. Associated with him is

BARR, JOSEPH S. S.B., M.D. Harvard University Medical School 1926. Orthopedic Surgeon to Out-Patients, Massachusetts General Hospital. Assistant in Orthopedics, Harvard Medical School. Assistant Surgeon, New England Peabody Home for Crippled Children. Address: 234 Marlboro Street, Boston, Massachusetts. Their subject is "Rupture of the Intervertebral Disc With Involvement of the Spinal Canal." Page 210.

CANNON, IDA M. Chief of Social Service, Massachusetts General Hospital, Boston. Her subject is "Teaching Medical Students the Social Implications of Sickness." Page 216. Address: Social Service Department, Massachusetts General Hospital, Boston, Massachusetts.

MISCELLANY

WORK AT THE SUMMER CAMP OF THE PRENDERGAST PREVENTORIUM

This camp now has sixty free patients and fifty-five boarding inmates.

Dr. Eli Friedman is the physician in charge of medical service.

In addition to the usual cases for which the camp was started, there is a service for diabetic patients.

This beneficent institution is maintained by the Boston Tuberculosis Association.

CORRESPONDENCE

ANOTHER TRIBUTE TO DR. POST

Editor, *New England Journal of Medicine,*

What I have to say of Dr. Abner Post touches the past farther back than the recollections of most. For I was his externe in his early service as Out-Patient Surgeon. Both of us saw the development of modern surgery "ab ovo" and Dr. Lund's appreciative letter about Dr. Post, as a surgeon, strikes some vibrating chords in my own mind. What surgery was in those days, few aggressive young surgeons of to-day can realize. I remember seeing a case with an interne. The diagnosis was in doubt. With a high temperature, there was some leaning toward typhoid. My verdict was: "There is pus about the caecum. The case ought to be operated on. Some day such cases will be. He will probably die." And this a year before Dr. Fitz concentrated attention on that region! The man didn't die. The pus worked into the bowel and was discharged by rectum as often occurs. Pus is a great navigator and often heads for port. Sometimes it may be given its chance. But here was, if the truth were told, simply the need of a knife cut. But this deficiency of surgery had its advantages. It enabled the case to be studied in its formative stage and in the development of what might be called its natural history. To make an apothegm: In the old days, conditions got in ahead of the surgeon; in the new, the surgeon often gets in ahead of conditions. Maybe such experiences had to do with qualities that Dr. Lund credits Dr. Post with, a certain uncanniness of diagnosis and his skillful handling of iliac abscesses. It's a tribute to Dr. Post's medical mind, for dia-gnosis (variant *dis*) is not simply knowledge (gnosis) but knowledge apart from. The discard is a mental process. We hear much about the medical man at the elbow of the operating surgeon, with perhaps a "furor operandi". Dr. Post perhaps had fused the two within himself. He had a widely diversified training. He talked with me about a case of typhoid in private practice. Endowed with a good mind, he had converted it into a good medical mind.

Dr. Post certainly had a broad outlook on medicine. During my four years as admitting physician, when autopsies had been rare, I secured 33 per cent, out of personal interest in the cases. The administration was in opposition, the staff indifferent and never attended; but Dr. Post showed his clinical interest by asking to be notified whenever there was an autopsy. Certainly there was plenty to be learned. I remember demonstrating the reflection of the peritoneum and the prevesical space to a man just starting a genitourinary life.

I recently heard a talk by the author of "Traumatic Surgery." In conversation with him I poked a little fun at him over "traumatic". To me it is always active; hence, "inflicting trauma". The Surgery of Trauma seems better, in order to avoid the "double entendre". Yet his discourse was highly pleasing because old-fashioned. Felons he classified as we used to and he was for moist dressings. ("Call it poultice if you will," he said.) But he omitted to mention shock, the first thing, whether threatened or actual, to be considered, in defence of the patient.

Soon after leaving the hospital, I was called to see a boy who had been run over by a heavily loaded two-horse team. The wheels had passed directly across the lower abdomen. He was collapsed, pulseless, and the shock was most profound. The police surgeon had summoned the ambulance to take him to the hospital. I sent it back. Seconds counted. The boy was left on the couch where he was first laid, fully clothed, not examined, but his shock alone attended to for twenty-four hours. Taken to the hospital later he was assigned to Dr. Post. Conferring together it was decided to treat him expectantly. There was a ruptured bladder (bloody urine) and a fractured pelvis. He simply lay there and got well, though developing an effusion in the pelvis as large as a fetal head. Perhaps some such experiences as this developed in Dr. Post the qualities that Dr. Lund admired.

As an out-patient surgeon Dr. Post was sometimes irascible, this later to be replaced by the gracious urbanity that was his. As he pondered, he whistled gently. Dr. Lund speaks of his modesty. In the early years he told me he never faced his audience that his "heart wasn't in his mouth". Pity there are not more affected in this way. A good *bon mot* appealing to many of us was "There won't be any Back Bay in Heaven."

SAMUEL DELANO, M.D.

New Britain, Conn.,
July 20, 1934.

A SURVEY OF THE ADEQUACY OF MEDICAL CARE

Essex North District Medical Society
Chartered 1841

July 21, 1934.

Editor, *New England Journal of Medicine,*

At a meeting of the full committee on Public Relations of the Massachusetts Medical Society, it was voted to make a survey of the adequacy of medical care in Massachusetts. The President appointed a subcommittee to outline methods of study.

It is at present considered probable that after the scope and plan of the work is outlined, it will be

carried on largely by the District committees on Public Relations. The initiation of these committees in each district was urged in the report of the Committee on Public Relations and adopted by the Council in February and reiterated in June.

It is to be hoped that the districts have given some consideration to this matter and will be ready to carry on the load of the work as soon as plans are completed.

Very truly yours,

E. S. BAGNALL, M.D., *Secretary.*

ARTICLES ACCEPTED BY THE AMERICAN MEDICAL ASSOCIATION COUNCIL ON PHARMACY AND CHEMISTRY

535 North Dearborn Street, Chicago, Ill.,
July 28, 1934.

Managing Editor,
The *New England Journal of Medicine,*

In addition to the articles enumerated in our letter of July 3 the following have been accepted:

Carbide and Carbon Chemicals Corporation

Triethanolamine — Carbide and Carbon Chemicals Corporation.

Lakeside Laboratories, Inc.

Ampoules Dextrose (d-Glucose) 50 Gm., 100 cc.

Eli Lilly & Co.

Ampoules Glucose (Dextrose, U.S.P.) Lilly, Unbuffered, 25 Gm., 50 cc.

Ampoules Glucose (Dextrose, U.S.P.) Lilly, Buffered, 25 Gm., 50 cc.

Ampoules Glucose (Dextrose, U.S.P.) Lilly, Unbuffered, 50 Gm., 100 cc.

Sharp & Dohme, Inc.

Ivyol-Poison Ivy Extract — Mulford, one syringe package.

United States Standard Products Co.

Diphtheria Toxoid, Alum Precipitated (Refined).

Erysipelas Streptococcus Antitoxin (Refined and Concentrated).

Dextrose Solution, 25 Gm., 50 cc.

Dextrose Solution, 50 Gm., 100 cc.

Yours very truly,

PAUL NICHOLAS LEECH, *Secretary,*
Council on Pharmacy and Chemistry.

RECENT DEATHS

SWASEY — EDWARD SWASEY, M.D., of Worcester, Massachusetts, was found dead in bed at the summer home of his daughter, Mrs. H. Wellington Smith, at Pleasant Point, Maine.

Dr. Swasey was born in 1853 and graduated in medicine from the Columbia University College of Physicans and Surgeons in 1878. He was a member of the Massachusetts Medical Society from 1891 to 1927.

He was a specialist in diseases of the nose, throat and eye. He had retired from practice because of ill health.

His daughter, a son, and a brother survive him.

MITCHELL — ARTHUR MITCHELL, M.D., of Medfield, Massachusetts, died at the Corey Hill Hospital, Brookline, July 24, 1934.

He was born at Temple, Maine, March 16, 1864.

He graduated in medicine from the Boston University School of Medicine in 1886 and had practiced in Medfield and surrounding towns for over forty years.

Dr. Mitchell joined the Massachusetts Medical Society in 1893 and had served on the staffs of the Norwood, the Leonard Morse Memorial, and the Framingham Union Hospitals. He was a member of the Natick Masonic Lodge and the Medfield Lodge of Odd Fellows.

His widow survives him.

SOCIETY MEETINGS, CONGRESSES AND CONFERENCES

August 18 - September 30—Medical Study Trip to Hungary. See page 975, issue of May 10.

September 3-6—American Public Health Association, at Pasadena, California. Dr. J. D. Dunshee, Chairman, Local Committee on Arrangements.

September 4, 5, 6—International Union Against Tuberculosis. For information address the National Tuberculosis Association, 450 Seventh Avenue, New York City.

September 10, 11, 12, and 13—American Congress on Physical Therapy will meet in Philadelphia at the Bellevue Stratford. For details write American Congress of Physical Therapy, 30 North Michigan Avenue, Chicago Illinois.

September 10-15—First International Congress of Electro Radio-Biology will be held in the Doges Palace at Venice. For details address the General Secretary of the Congress, Dr. Giocondo Protti, S. Gregorio 173, Venice (Italy).

September 27 and 28—International Association for Preventive Pediatrics will be held at Lyons. For details address the Secretary of the I. A. P. P., 15 rue Lévrier, Geneva (Switzerland).

September 28-29—New England Surgical Society will meet at Burlington, Vermont. For details address the Secretary, Dr. John M. Birnie, 14 Chestnut Street, Springfield, Mass.

October 22 - November 2—1934 Graduate Fortnight of the New York Academy of Medicine. See page 1240, issue of June 7.

October 31 - November 2—Massachusetts State Nurses' Association, Hotel Statler, Boston. For information write Miss Helene G. Lee, R.N., 420 Boylston Street, Boston.

April 29 - May 3, 1935—The American College of Physicians will meet in Philadelphia. For information address Mr. E. R. Loveland, Executive Secretary, 133-135 South 36th Street, Philadelphia, Pa.

June, 1935—Medical Library Association will meet in Rochester, N. Y. For details address the Secretary: Miss Frances N. A. Whitman, Librarian, Harvard University Schools of Medicine and Public Health, Boston, Mass.

BOOKS RECEIVED FOR REVIEW

A Primer for Diabetic Patients. By Russell M. Wilder. Fifth Edition, Reset. 172 pp. Philadelphia and London: W. B. Saunders Company. $1.75.

The Dangerous Age in Men. A treatise on the prostate gland. By Chester Tilton Stone. 105 pp. New York: The Macmillan Company, 1934. $1.75.

The Surgical Clinics of North America. June, 1934. Volume 14— Number 3. Mayo Clinic Number. 742 pp. Philadelphia and London: W. B. Saunders Company. February 1934 to December 1934. Paper, $12.00; Cloth, $16.00 net.